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Cooperation and Sustainable Development

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Preface

The publication of a book on the topic of cooperation and sustainable development was undertaken because, firstly, the goals of sustainable development are in dire need of effectively applied mechanisms to ensure their practical implementation, and cooperation is one of such mechanisms. Secondly, the contribution of cooperation to the sustainable development of modern economic systems has not been sufficiently studied, and the book fills this gap.

The significance of the topic of cooperation and sustainable development, covered in the book, is especially high in the context of the COVID-19 crisis, which has had a strong impact on modern socioeconomic systems, noticeable around the world and focused on the long term. Cooperation is a proven highly effective tool for economic crisis management, as it allows combining the resources and efforts of business entities to solve common problems. The implementation of Sustainable Development Goals is a priority problem to be solved with the help of cooperation.

This book is intended for scientists researching the issues of cooperation and sustainable development, as well as for subjects of responsible production and consumption, and government regulators involved in the process of practical implementation of Sustainable Development Goals. The competitive advantage of this book, which distinguishes it from other existing publications, is a systematic view of cooperation and sustainable development, which are considered in this book as integral components of socioeconomic crisis management in the context of the ongoing pandemic and the COVID-19 crisis.

The book reflected the whole range of manifestations and promising directions for the cooperation development in the interests of the Sustainable Development Goal implementation at the level of the world economy, at the level of national and regional economies, and at the level of entrepreneurship. A multilayered approach to highlighting the perspectives and benefits of cooperation for sustainable development defines the uniqueness and novelty of this book.

The book reflects the digital context of cooperation and sustainable development, the social factors, and factors of the institutional environment influencing them (legal framework and state regulation). The book also reflects the experience and prospects of improving the organization and management of cooperative business entities and

reveals the development and presentation of case experience and territorial features of cooperation of entrepreneurial entities in Russia. The described issues are disclosed in six parts of the book.

The book is intended for comprehensive coverage of issues, on the one hand, related to the current contribution of cooperation to the implementation of Sustainable Development Goals and the maximization of this contribution, as well as, on the other hand, to transform the context of cooperation in the modern economy in the context of the practical implementation of Sustainable Development Goals. Bilateral consideration allows the most detailed and deep revealing of the essence of cooperation and sustainable development as inextricably linked phenomena of the modern economy.

Moscow, Russia

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Volume I. Socio-economic and legal issues of cooperation for sustainable development

Part I. The Development of Business Structures Cooperation in the Digital Economy
Part II. Social Factors of Business Structures Cooperation in the Modern Economy
Part III. Legal Framework and Regulation of the Cooperative Sector of the Economy

A systematic view of cooperation and sustainable development (Introduction)

Cooperation is a reflection of the current economic reality and mood in society. Cooperation can be carried out in entrepreneurship both within the framework of strategies for its development to strengthen market positions in the conditions of stability and growth of the economy and within the framework of economic crisis management in the conditions of a recession in the economy. Accordingly, consumer cooperation can be carried out both in response to favourable conditions for the creation of common goods during the period of economic recovery and in response to unfavourable conditions for maintaining the level and quality of life during the economic recession.

This book takes into account the cyclical nature of cooperation and offers scientific and methodological recommendations and developments for monitoring cooperation and flexible interpretation of its meaning depending on the socio-economic landscape. The modern landscape is notable for the acute phase of the COVID-19 crisis, which fell in 2020-2021, against which it is especially interesting to study the features of the cooperative sector of the economy's development, which is given special attention in the book.

In addition to the pandemic, the book comprehensively takes into account other sustainable development challenges, including various digital transformations of socio-economic realities, an increase in the level of consumer consciousness under the influence of the "knowledge economy" (education development), and the implementation of sustainable development goals (institutionalization of responsible

production and consumption practices), and also the modernization of the legal norms and a change in the approach to the regulation of the cooperative sector of the economy, depending on the latest trends in globalization and competition.

This book is interesting and unique in that it forms and reflects a systematic view of cooperation and sustainable development. This new view of cooperation covers both its consequences for the sustainable development goals implementation (the 17 goals) and sustainability as a characteristic and development priority of the cooperative sector of the economy itself. This view is consistently disclosed in six parts of this book, divided into two volumes.

This first volume contains three sections that reveal the essence and scientific methodology of sustainable development of the cooperative sector of the economy. The first part examines the features and analyzes the international practical experience in the development of business structures cooperation in the digital economy. It examines successful examples and identifies prospects for the modernization of the cooperative sector of the economy based on advanced digital technologies (Big Data, Internet, and Virtual Reality). The experience and prospects of cooperation in the "smart" city and the age of intelligent machines are considered.

The second part examines the social factors of business structures cooperation in the modern economy. Here the experience of the sustainability of consumer cooperatives in the context of ensuring economic security is considered. The essence of continuous consumer business cooperation as a new phenomenon of the cooperative sector of the economy in the context of sustainable development is revealed. The influence of universities, education, and consumer behaviour on cooperation is reflected.

The third part defines the regulatory framework and examines the experience and features of regulating the cooperative sector of the economy. It introduced the concept of "public-cooperative partnership". The principles of state monitoring and control of the cooperative sector of the economy in the interests of maintaining its stability and ensuring economic security have been determined. A special chapter of this part is devoted to the features of the legal regulation of contractual relations of cooperative organizations in the context of the COVID-19 pandemic.

Socio-economic and legal gaps in cooperation that underestimate its contribution to sustainable development (Conclusion)

This first volume of the book highlighted the socio-economic and legal gaps in cooperation that underestimate its contribution to sustainable development. One of the identified gaps is the contradictory impact of the digital economy on the development of business cooperation. On the one hand, the new economic reality of the fourth (digital) technological order enhances the distancing of economic entities (moves them away from each other), undermining the traditional foundations of physical

cooperation, which provides for the geographical proximity (unity of the territory) of the subjects of cooperation.

On the other hand, digital technologies stimulate electronic cooperation that is not tied to geographic boundaries. Interregional and international cooperation is becoming more accessible and more represented in the modern digital economy. Nevertheless, many organizational and managerial issues remain unresolved, in particular, questions about how to overcome cultural differences (including in the aspect of different organizational cultures) in interregional and international cooperation, as well as questions about how to use digital technologies in the interests of electronic cooperation.

Another gap is associated with the contradictory influence and uncertainty in the management of social factors of business structures cooperation in the modern economy. Speaking about the factors of the labour market, it should be noted that it is not clear what human resources are necessary for the development of cooperation in the current economic conditions. The transition to the fourth technological order increases the need for digital personnel, but cooperation requires not only technical but also communication competencies, which are not given sufficient attention in personnel training.

Speaking about society, it should be noted that the modern social environment is becoming more and more inclusive: gender-neutral, open for people with disabilities and people with low incomes. However, from the standpoint of cooperation, social inclusion is ambiguous - it interferes with social identity. The erasure of social differences violates the logic of cooperation, and consumer cooperation is increasingly conditioned by direct economic reasons and does not receive adequate social support.

The gaps also include the lagging development of the regulatory framework and suboptimal regulation of the cooperative sector of the economy. The new electronic form of cooperation is an emerging and dynamically developing social institution that does not fit into the previous norms of law. For the regulatory support of this institution, it is not enough to prescribe its essence and legal field one-time - constant changes are required as this institution transforms, which are inaccessible due to the lack of flexibility of the state apparatus.

These gaps are filled in the second volume of this book, which reveals perspectives and offers recommendations for improving cooperation for sustainable development.

Volume II. Prospects for improving cooperation in the interests of sustainable development

Part I. Experience and Prospects for Improving the Organization and Management of Cooperative Business Structures
Part II. The Impact of Business Structures Cooperation on Sustainable Development
Part III. The Case Experience and Territorial Features of Business Cooperation in Russia

Cooperation for sustainable development: from theory to practice (Introduction)

The Sustainable Development Goals (SDGs) have defined the global landscape of modern cooperation, which makes a significant contribution to their practical implementation. Thus, consumer cooperation allows the fight against poverty (SDG1, for example, based on the sharing economy) and hunger (SDG 2 - based on agricultural cooperatives). Cooperation (collaboration) with the participation of business structures, universities and research institutes contributes to health (SDG 3 - based on medical clusters) and SDG 4 (based on consortia and educational clusters).

Community-based cooperation contributes to gender equality (SDG 5) and the reduction of inequalities (SDG 10). Regional cooperation enables the creation of progressive (SDG 8-9) and sustainable cities and towns (SDGs 6-7, 11-15). Cooperation allows developing institutions and defending the rights of business entities with common interests (SDG 16, based on civil society). International cooperation ensures partnerships for sustainable development (SDG 17).

The first volume of this book clarifies the modern context of cooperation and identifies barriers to its development. This second volume is devoted to overcoming identified barriers and the development of scientific, methodological and applied recommendations for the fullest disclosure of the potential of cooperation to support the SDGs. The purpose of this second volume is to reflect the prospects for improving cooperation for sustainable development.

Three parts of this second volume of the book (four through six) reflect the consequences of the functioning and development of the cooperative sector of the economy for the sustainability of economic systems. The fourth part presents the experience and prospects for improving the organization and management of cooperative business structures. It examines the features of the assessment and management of investment potential and labour productivity in the cooperative sector of the economy. The foundations of the innovative development of this sector, quality control in it, and maintaining its inclusive growth, with special attention to small and medium-sized businesses, have been determined.

The fifth part is devoted to the impact of business cooperation on sustainable development. It examines advanced innovations in the field of sustainable development and prospects for their development and implementation based on cooperation. The role of cooperative environmental entrepreneurship in a socially-oriented society is determined. Recommendations are proposed for ensuring sustainable enterprise development in the context of the systemic crisis of the global transformation of society.

The sixth (final, but no less significant) part illustrates the case experience and territorial features of business structures cooperation in Russia. It examines the features of the impact of cooperation on the economic security of the regions of Russia. Successful examples of land control in the system of sustainable development of municipalities are given. It also examines the impact of regional infrastructure on the development of the cooperative sector of the economy.

Prospects for cooperation in the context of sustainable development (Conclusion)

Cooperation defines the modern foundations of sustainable development. As this book has shown, 2020-2021 became a turning point in the modern history of cooperation. The development of the cooperative sector of the economy around the world and in Russia, in particular, has become an economic response to the COVID-19 pandemic. Cooperation allowed supporting entrepreneurship and preventing a critical decline in the level and quality of life of the population in the context of the economic crisis. An important role in the development of modern cooperation is played by digital technologies, which make it possible to bring business and consumer cooperation to a new level of quality, efficiency, transparency, and stability, thereby increasing its sustainability.

Social progress also strongly affects the development of cooperation, defining the interests of maximizing its contribution to the sustainable development goals implementation and ensuring the sustainability of the cooperative sector of the economy. An important role in this process is played by education, increasing the corporate social responsibility of cooperative business structures and the level of consumer consciousness. The new socio-economic landscape requires updating and improving

the organization and management models of cooperative business structures, as well as legal regulation of the cooperative sector of the economy in the interests of sustainable development. The experience of Russia has shown that cooperation can contribute to the development of territories, but for this, it must take into account their peculiarities.

This book systematically presented modern experience and the latest achievements in the field of cooperation in the context of sustainable development. The prospects of this process are associated with an even greater harmonization of cooperation and sustainability and the continuation of the outlined tendency of institutionalization as a positive impact of cooperation on the implementation of sustainable development goals and sustainable cooperation. Along with this, new topical issues of cooperation arose in the context of sustainable development.

One of the questions is whether it is worth studying and managing the two aspects of cooperation in the context of sustainable development separately, or the line between them in the future should be erased. The potential separation of these two aspects is fraught with the fact that in some economic systems (countries or territories within countries) sustainable cooperation can be institutionalized, but at the same time, its negative impact on the implementation of sustainable development goals can be observed. In contrast, in other economic systems, cooperation can become an instrument of sustainable development, but it cannot acquire the feature of sustainability.

Another question is what new challenges the cooperation will face in the future. The COVID-19 pandemic and crisis have become an unexpected challenge and it is likely that in the coming years, the socio-economic reality will continue to be unpredictable or even the level of uncertainty will increase. New scientific and methodological developments and promising applied solutions are needed for successful and timely adaptation of cooperation to future challenges of sustainable development. It is advisable to devote further research to these issues.

Contents

The Development of Business Structures Cooperation in the Digital Economy

Application of Big Data to Analyze Illegal Passenger Transportation Offenses

Irina A. Zhilyaeva, Stanislav V. Suvorov, Natalia I. Tsarkova, and Anastasia D. Perekatova

Abstract One of the most critical stages of big data analysis is data preparation, the result of which is a processed and structured dataset in tabular form. This paper discusses the first stage of forming a dataset to be analyzed—the design of the database. For this purpose, we analyzed modern database management systems (Oracle Database, Microsoft SQL Server, PostgreSQL) and chose one of them to solve a specific problem—creating a database of offenses in the field of illegal passenger transportation recorded in Moscow by volunteers of the Center for Prevention of Crime and Delinquency. Additionally, the paper indicates the main stages of database design and identifies the main areas of further work: (1) creating and scoping the designed database in PostgreSQL, (2) development of data processing scripts, and (3) their further analysis using big data technologies.

Keywords Big data · Data preparation · Dataset · Illegal passenger transportation · Database management system · Database · Conceptual database model

JEL Codes C60 · C81 · R40 · O3 · J0

1 Introduction

One of the priorities in the Russian policy is the fight against illegal passenger carriers. Passenger transportation without an appropriate license (in urban, suburban, intercity, and international traffic) reduces the level of transport safety, thereby increasing the number of traffic accidents. Additionally, due to the illegal activities of such carriers, regional budgets do not receive taxes, and the revenues of official carriers fall.

Illegal passenger transportation in Moscow is suppressed by the Autonomous Non-Profit Organization Center for Prevention of Crime and Delinquency (ANO CPCD) together with law enforcement officers and authorized government bodies under an agreement between the Government of Moscow and ANO CPCD (2016).

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Public patrols reveal the facts of illegal passenger transportation and take measures within the current legislation.

2 Methodology

Each week, the head of the Department of Transport and Road Infrastructure Development of Moscow receives a report on the patrol results created in the program InDesign and stored in.pdf format.

The number of detected offenses is growing every day (on average, the CPCD volunteers record 50–80 vehicles per day). Therefore, for operational work with the received data, there is a need for a unified register containing information about the offense. This register should provide an opportunity to quickly determine the number of violations for a certain period, the number of detected vehicles, passenger carriers, and the usual time of registering violations, day of the week, month, and other information.

In order to implement such a comprehensive approach to the analysis of offenses in the field of illegal passenger transportation, it is necessary to create a database.

3 Results

Thus, our research focuses on the analysis of modern database management systems (DBMS), the choice of DBMS for the specific task, and the development of database models, that is, preparing a set of data for further analysis using big data.

DBMS on the representation and processing of data are divided into groups; the main ones are relational, network, hierarchical, object-oriented, object-relational, and others.

Relational DBMS are the most popular management systems. In these systems, data is stored in tables, and the unit of storage is a record.

However, technology does not stand still, and the idea of using "flexible" approaches has become very popular. Object-relational databases combine the best qualities of relational and object-oriented databases. The main advantage of such a database is the storage of large amounts of data (photos, videos, large documents, etc.) (Novikov and Gorshkova 2019).

In the considered example, it is possible to use both the traditional relational model and object-relational DBMS.

Nowadays, there is a process of import substitution in the field of information technology. The market of object-relational DBMS is no exception. In this regard, most businesses are moving to foreign DBMS, such as Oracle Database, Microsoft SQL Server, PostgreSQL, etc.

Table 1 shows a comparison of the most popular DBMS.

Table 1 Comparative characteristics of DBMS

Comparison criterion		Database management systems			
		Oracle database	Microsoft SQL Server	MySQL	PostgreSQL
1	Performance	All DBMS have a sufficient level of performance, reliability, stability, and security			
2	Reliability				
3	Stability				
4	Security				
5	Availability (0—not available; 5—available to all)	3	4	5	5
6	Portability (“ + ”—portable; “–”—not portable)	+	–	+	+
7	Scalability	1	1	–	4
8	Maximum possible size of the database	< 1 000 TB	< 100 TB	–	< 100 TB
9	Completeness of SQL standard implementation	4	4–	1	4+
10	Quality of SQL standard implementation	5	4	–	5

Source Compiled by the authors based on Perlin (2015)

Thus, based on the comparative analysis of databases, we can conclude that PostgreSQL has clear advantages since it is free, easy to administer, and has good performance. The growing popularity of PostgreSQL in Russia was noted at PGConf.Russia 2019, the international conference of PostgreSQL developers and users, organized on February 4–6, 2019, at Moscow State University by famous Russian developer Oleg Bartunov. The chart presented in the report showed the growth in popularity of PostgreSQL in Russia relative to Oracle, MySQL, and Microsoft SQL Server from 2013 to 2019 (Fig. 1) (Bartunov 2019).

At the initial stage of database design, the task is set by a textual description of the system. The main tasks of the simulated system are (1) to store in the database necessary data on offenses in the field of passenger transportation, (2) create necessary forms for reporting, and (3) generate summary results of public patrolling for a certain period.

The main requirement for creating this database is the anonymity of personal data (vehicle registration numbers). In this regard, each vehicle must be assigned an

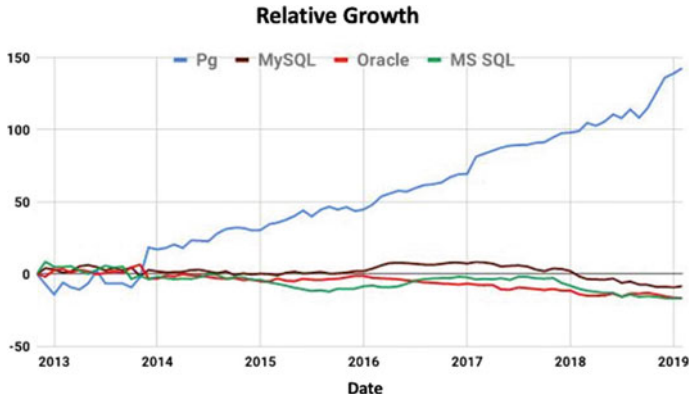

Fig. 1 Growing popularity PostgreSQL (Bartunov 2019)

identification number corresponding to a specific vehicle number, allowing one to omit confidential data when downloading or performing other manipulations.

The main entities of the designed database are "Vehicle," "Vehicle categories," "Carriers," "Passenger transportation," and "Offense Registry."

The second stage of database design includes the development of a conceptual model, which defines the minimum set of attributes and their description for the entities of the modeled system.

Tables 2, 3, 4, 5 and 6 present the attributes of the above entities, their descriptions, and features of use.

Thus, Tables 2, 3, 4, 5 and 6 display the main attributes of the entities in the designed database. All relations between tables correspond to the One-to-Many (1:M) type.

Table 2 Attributes of the "Passenger transportation" entity

Attribute name	Description and features of use
ID of transportation type	Primary key (counter)
Transportation type	Name of the performed transportation: • Illegal interregional transportation of passengers from the territory of Moscow; • Transportation by carriers who have signed a contract with Mosgortrans but violate the departure procedure; • Duplicating legal carriers and performing interregional transportation of passengers by vehicles of M1 category; • Duplicating legal carriers and performing illegal transportation of passengers in the adjacent and municipal territories by vehicles of M1 category; • Ordered bus transportation from shopping malls; • Illegal transportation of passengers and luggage in international traffic

Table 3 Attributes of the "Vehicle" entity

Attribute name	Description and features of use
Vehicle ID	Primary key that uniquely identifies the vehicle (counter)
Vehicle registration number	Registration number of the vehicle according to the structure corresponding to the type 1, 1A, and 1B of GOST R 50577-2018
Vehicle category ID	External key to the "Vehicle categories" directory

Table 4 Attributes of the "Vehicle categories" entity

Attribute name	Description and features of use
Vehicle category ID	Primary key (counter)
Vehicle category	Category name (M1, M2, M3) (short text)

Table 5 Attributes of the "Carriers" entity

Attribute name	Description and features of use
Carrier ID	Primary key (counter)
Carrier	Carrier name (IE (individual entrepreneur) "Name," LLC "Name" (short text)

Table 6 Attributes of the "Offence Register" entity

Attribute name	Description and features of use
Offense ID (counter)	Primary key (counter)
Carrier ID	External key referencing the "Carriers" table
Vehicle ID	External key referencing the "Vehicle" table
ID of transportation type	External key referencing the "Transportation type" table
Date and time of recording	A real number (the integer part is the date and the fractional part is the time)
Departure point	Name of the departure point (short text)
Destination	Name of the destination point (short text)
Passenger traffic	Number of passengers per week (numeric)
Note	Information provided by the GKU *Organizer of transportation* and GKU *Mosgortans* (long text)

Source Compiled by the authors

4 Conclusion

Thus, at the initial stage, we designated the subject area and set the task. Based on this, we conducted a comparative analysis of modern database management systems and selected the object-relational database management system PostgreSQL. At the next stage—the design of the database of offenses in the field of illegal passenger

transportation—we made a textual description of the database and developed its conceptual model.

In subsequent stages, we plan to create a designed database in PostgreSQL, fill the database with data provided by the Center for Crime and Delinquency Prevention, subsequently develop scripts for processing the array of data, and ensure its subsequent analysis using big data.

For the analytical processing of large amounts of information, it is possible to use various methods of Data Mining and Machine Learning, as well as neural networks, simulation modeling, etc. To analyze big data presented in a relational database format, we can use Hadoop Database, which is a hybrid of the distributed computing paradigm (MapReduce) and relational DBMS technologies. Thus, Hadoop is used as a software platform implementing the MapReduce-computing system. This system provides the communication infrastructure by integrating the computing nodes of the cluster, which, in turn, run instances of PostgreSQL. User SQL queries are passed to the MapReduce environment as tasks, which are then passed to the DBMS instances (Zymbler 2014).

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Directions of Cooperation Relations Development in Russia in Conditions of Digitalization of the Agricultural Sector

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Abstract Digitalization is becoming a new trend in the modern economy and public life. The promotion of the cooperative movement can help to solve the problems of ensuring food security in Russia, sustainable development of rural areas and export-oriented agribusiness; it helps the introduction of innovations to increase labor productivity and resource efficiency in digital agriculture. The undeniable effectiveness of cooperation between participants in agricultural production due to the introduction of digital platforms where it is possible to post electronic messages, share experience, carry out reengineering, training, consulting, introduce project solutions in the regions, create databases, justifies the relevance of research on the development of cooperative ties in Russia in the conditions of digitalization of the agricultural sector. The work uses a systematic approach and synergy methods to analyze the development of cooperative ties in the context of the transformation of the agricultural sector within the framework of digitalization. As a result of the study, the authors outlined the directions for the development of cooperation in the agriculture of Russia, related to: grant support for novice farmers and family livestock farms—agrostartaps; with a new system of subsidizing cooperatives to compensate part of the costs of selling agricultural products, purchasing farm animals or agricultural equipment for members of the cooperative; with the creation and provision of competence centers.

Keywords Digitalization of the economy · Digital agriculture · Innovative activity of enterprises · Activities of agricultural cooperatives · Directions of development of cooperative ties

JEL Codes Q01 · Q13

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1 Introduction

Agriculture is "the philosophy of the people, their way of life, the way of existence in an inextricable connection with agriculture, a whole way of life associated with the world of wildlife" (Andersen et al. 2020). With the rapid pace of economic development associated with the dynamics of achievements in high technologies, new trends are emerging in the evolution of the industry structure in the world. At this stage of development, the progress of the digital economy is clearly visible, which is actively being introduced into all spheres of life: the social sphere, the entrepreneurial sector, as well as in agriculture. In an age of rapid development of computer technologies, accelerating time and growing competition, the need for digitalization of the economy is undeniable. The promotion of the cooperative movement can help to solve the problems of ensuring food security in Russia, sustainable development of rural areas and export-oriented agricultural business and the introduction of innovations to increase labor productivity and resource efficiency in digital agriculture.

The content and essence, as well as the peculiarities of the course of digitalization, as a promising trend in the development of the economy and society, are the subject of scientific discussions. The problems of agricultural consumer cooperation in the economic literature are considered in terms of factors and conditions of development, the scale of their activities, economic efficiency and competitiveness. At the same time, most researchers note that there are problems in the institutional environment and cooperative legislation, the state does not have effective tools to provide the necessary support to the cooperative movement, and the cooperation itself is developing slowly. The undeniable effectiveness of cooperation between participants in agricultural production due to the introduction of digital platforms where it is possible to post electronic messages, share experience, carry out reengineering, training, consulting, introduce project solutions in the regions, create databases, justifies the relevance of research on the development of cooperative ties in Russia in the conditions of digitalization of the agricultural sector.

2 Methodology

The work uses a systematic approach and synergy methods to analyze the development of cooperative ties in the context of the transformation of the agricultural sector within the framework of digitalization.

3 Results

The discussion of the problem should begin with the definition of the concepts of "digital economy" and "digital agriculture." The digital economy is an economic

Table 1 Main indicators of the development of the digital economy of Russia

	2017	2018	2019	2019–2017 (%)
Domestic expenditures on the development of the digital economy at the expense of all sources in % of GDP	1.9	1.9	2.1	110.5
Number of publications by Russian authors (Scopus database), as a percentage of global ICT publications	2.65	2.76	3.12	117.7
Share of innovative goods, works, services in the total volume of goods shipped, works performed, ICT services, %	6.4	6.6	8.0	125.0
Gross value added of the ICT sector in% of GDP	2.87	2.75	2.81	97.9
Proportion of households with access to the Internet in the total number of households, %	76.3	76.6	76.9	100.7
Share of business sector organizations (in total) using: broadband Internet, %	80.5	81.6	86.0	106.8

Source Compiled by the authors based on Abdrakhmanova et al. (2020)

activity, as well as a system of socio-economic relations that focus on the use of digital and electronic technologies. Digital agriculture is an innovative synergy of agricultural science, modern information technologies and network communications. The stages of digital transformation of society include (Table 1):

1. The initial stage (2018–2019) included the implementation of start-up research work within the framework of the budget for informatization;
2. The functional stage (2020–2023) includes the creation of a mechanism for serial implementation of initiatives and projects—2020, the formation of digital industries of platforms, business platforms, digital services—2023;
3. The final stage (2024–2025) includes the formation of an ecosystem of digital platforms, services and businesses. The dynamics of indicators of the development of the digital economy for 2017–2019. in Russia allows us to conclude that the introduction of "numbers" in our country is happening at an increasing pace (Table 1). However, taking into account the goals of the Federal Scientific and Technical Program for the Development of Agriculture for 2017–2025 and the departmental project "Digital Agriculture," the process of digital transformation is weak.[1,2]

The situation is aggravated by the adjustments that the coronavirus pandemic introduced in 2020. The unfavorable economic situation that has developed throughout the world and in our country, according to the authors, will slow down the process

[1] Decree of the President of the Russian Federation of May 7, 2018 №. 204 «on national goals and strategic objectives of the development of the Russian Federation for the period up to 2024» [Electronic resource]. URL: https://base.garant.ru/71937200// (Data accessed: 10.12. 2020).

[2] Departmental project «Digital agriculture» [Electronic resource]. URL: http://mcxac.ru/o-tsentre/prezentatsionnye-materialy (Data accessed: 11.12. 2020).

of promoting digital technologies. The decline in production and the increase in the number of unemployed cannot contribute to the introduction of innovations.

The index of volume of gross domestic product of Russia in the III quarter of 2020 relative to the corresponding period of 2019, according to preliminary estimates, amounted to 96.4% (Abdrakhmanova et al. 2020). Nevertheless, the process of investing in the fixed assets of Russian enterprises, which is the basis for the promotion of digital technologies, is actively continuing. Even according to the results of the first two quarters of 2020, there is an absolute increase in investments compared to similar periods of 2019 (Table 2).

The table shows that the process of investing in fixed assets at the expense of budget funds tends to decrease. This negatively affects Russian enterprises, reduces the index of their entrepreneurial confidence. Nevertheless, agriculture is the only industry that, in the conditions of the crisis caused by the pandemic, in 2020 gave good results. According to the Ministry of Agriculture of Russia, in 2020 over 130.9 million tons of grain were added to farms of all categories, which is 10.2% more than on the corresponding date of the previous year. The index of production of the main types of livestock products in farms of all categories in 2020 year compared to the same period of 2019 year amounted to: under the article cattle and poultry—101.8, milk—101.7, eggs—99.5.[3]

The level of innovative activity of organizations as a whole in Russia is declining. However, in a number of sub-sectors of mixed agriculture and auxiliary activities in the field of crop production and post-harvest processing of agricultural products, this indicator increased for the period 2017–2019 (Table 3).

The volume of investments in the fixed assets of enterprises included in the Agriculture section of Russian National Classifier of Types of Economic Activity, forestry, hunting, fishing and fish farming in 2019 increased by 21.7% compared to 2017. Therefore, Russian agriculture, despite unfavorable macroeconomic conditions and existing problems, has the opportunity to switch to digital technologies. In this process, the cooperative movement can provide great assistance.

Modern views of researchers on cooperatives define them as a radically alternative economic project with clearly expressed social and community goals and consequences. Cooperatives are the most appropriate institutional environment suitable for the application of equitable, egalitarian and equitable conditions for the development of mutually beneficial economic relations between agricultural organizations, K (F) X, rural individual entrepreneurs and personal subsidiary farms (Sobolev 2020).

In Russia, according to the Association of Peasant (Farm) Farms and Agricultural Cooperatives of Russia (ACCOR), in 2019, 5,828 agricultural consumer cooperatives were registered. They consisted of 392,521 shareholders (that is, members of cooperatives) (Bashmachnikov 2019). This is a fairly large number of cooperatives, only about 4 thousand of them operate. And in 2019, they produced products for only 30.1 billion rubles (Bashmachnikov 2019). Of course, this number is not enough for Russia's scale, given that agricultural cooperatives around the world bring together more than 1 billion members, create jobs for 9% of the world's employed population,

[3] Federal state statistics service. URL: https://rosstat.gov.ru// (Data accessed: 15.11. 2020).

Table 2 Investments in fixed assets, billion rubles

Year	Quarters					Among them, at the expense of own funds of enterprises, Year		Among them, at the expense of budget funds, Year	
	Year	I	II	III	IV	Billion. rubles	In % of total investments	Billion. rubles	In % of total investments
2017	16,027.3	2,243.7	3,392.8	3,934.5	6,456.3	6,290.7	39.2	2,003.4	12.3
2018	17,782.0	2,451.2	3,757.3	4,564.1	7,009.4	7,229.5	40.6	2,085.8	11.8
2019	19,318.8	2,688.5	4,094.8	4,945.8	7,589.7	8,127.7	42.0	2,380.4	12.3
2020	–	2,889.3	4,027.3	–	–	–		–	–

Source Compiled by authors based on Federal state statistics service, 2020 (see Footnote 3)

Table 3 Level of innovative activity of organizations in the Russian Federation, by type of agricultural activity, %

	2017	2018	2019	2019–2017 (%)
Total	14.6	12.8	9.1	62.3
Of which by type of economic activity: Growing annual crops	5.1	4.0	4.8	94.1
Growing perennial crops	4.6	1.4	2.4	52.1
Growing seedlings	6.3	5.6	5.0	79.3
Livestock production	4.8	4.2	4.0	83.3
Mixed agriculture	1.3	9.4	2.8	215.3
Support activities	3.1	3.4	4.3	138.7

Source Compiled by authors based on Federal state statistics service, 2020 (see Footnote 3)

process and trade with almost half of all agricultural products, provide farmers with better market access and higher profits (Myasnikovich 2020).

The problems of the cooperative movement in Russia consist in the imperfection of cooperative legislation; unresolved land relations; inaccessibility of credit resources to many farmers; lack of skills in economic self-management; Limited scope for special tax regimes; the high degree of distrust and the risks of fraud, the difficulties of obtaining state support by cooperatives created by farmers, and not by district authorities. Cooperative programs in the context of the digital transformation of society would reasonably be supplemented by measures to stimulate environmental and social activities, which would help diversify the activities of cooperatives and, along with environmental problems, solve social and economic problems.

Another problem of the development of the cooperative movement in the conditions of digitalization of the agricultural sector of the economy is the lack of personnel with the necessary competencies in the digital economy (Mann 2018). Now the federal project "Personnel of the digital economy" is being implemented from 2018 to 2024, according to which by 2024 it is expected that 800 thousand graduates will have skills in the digital economy, and the share of the population with digital literacy skills will be 40%, the number of retrained specialists—100 thousand people (Bashirzade et al. 2019).

The activities of agricultural cooperatives are multifaceted. In addition to traditional services for agricultural producers and the food market, cooperatives implement environmental and energy-efficient programs, implement models for building a social and fair economy; purchase of food, optimization of the ratio of income and costs of agribusiness, control the quality of food and promote information in consumer circles. Through the assistance of cooperatives, the logistics of farmers is

provided. For example, during the period of cooperation between ACCOR (Associations of peasant farms and agricultural cooperatives of Russia) and JSC "Rosagroleasing", 675 units of agricultural equipment were provided to ACCOR members in the amount of more than 1.5 billion rubles.[4]

Economically feasible cooperative ties are a new trend in the spatial development of rural areas and allow farmers to solve many problems when forming regional markets for organic products and selling products. On average, organic farming systems have lower yields than conventional farming systems. However, the greater the biological diversity of organic foodstuffs and farming systems through practices such as crop rotation, inter-crop crops can increase yields. Yields in organic farming systems can also be higher in regions with adverse climatic conditions. Organic farming tends to be more beneficial for farmers, especially when they profit from the growing demand for environmentally friendly products (Podsevatkina et al. 2019). The creation of large cooperatives of private owners will allow the application of different practices of farming systems for the creation of organic products (Fomicheva and Kataeva 2020).

On the basis of the Economic Commission for Europe, a number of projects are being implemented aimed at creating and strengthening cooperative ties—Platform i1—Farmer i1 project, Concept of a unified information system for traceability of food products based on the principles of the HACCP (Kondrashov 2020). The effectiveness of cooperation between participants in agricultural production is realized through the introduction of digital platforms where it is possible to post electronic messages, share experience, carry out reengineering, training, consulting, implement project solutions in the regions, and create databases.

The directions for the development of cooperation in agriculture in Russia are related to: grant support for novice farmers and family livestock farms—agro-startups; with a new system of subsidizing cooperatives to compensate part of the costs of selling agricultural products, purchasing farm animals or agricultural equipment for members of the cooperative; with the creation and provision of competence centers.

4 Conclusions

Russian agriculture, despite unfavorable macroeconomic conditions and existing problems, has the opportunity to switch to digital technologies. In this process, the cooperative movement can provide great assistance. Unfortunately, today the process of creating cooperative ties between agricultural producers is weak. In Russia, agriculture is dominated by large vertically integrated structures that take part in the creation of agricultural parks and agropolis. However, cooperatives are the most

[4] Stages of digital transformation: what will you have to go through? [Electronic resource]. Information portal «Rusbase». URL: https://yandex.ru/search/?textstagesofdigitaltransformation (Data accessed: 19.11. 2020).

appropriate institutional environment suitable for the application of equitable, egalitarian and equitable conditions for the development of mutually beneficial economic relations between agricultural organizations, peasant farms, rural IE and personal subsidiary farms. Economically feasible cooperative ties are a new trend in the spatial development of rural areas and allow farmers to solve many problems when forming regional markets for organic products and selling products. Cooperatives implement environmental and energy-efficient programs, implement models for building a social and equitable economy; purchase of food, optimization of the ratio of income and costs of agribusiness, control the quality of food and promote information in consumer circles. Through the assistance of cooperatives, the logistics of farmers is provided.

The problems of the cooperative movement in Russia consist in the imperfection of cooperative legislation; unresolved land relations; inaccessibility of credit resources to many farmers; lack of skills in economic self-management; Limited scope for special tax regimes; high mistrust and fraud risks. In the context of the digital transformation of society, the authors believe that it would be prudent to supplement cooperation programmes with measures to stimulate environmental and social activities, which would help diversify the activities of cooperatives and, along with environmental problems, solve social and economic problems. Another problem of the development of the cooperative movement in the conditions of digitalization of the agricultural sector of the economy is the lack of personnel with the necessary competencies in the digital economy.

The directions for the development of cooperation in agriculture in Russia are related to: grant support for novice farmers and family livestock farms—agro-startups; with a new system of subsidizing cooperatives to compensate part of the costs of selling agricultural products, purchasing farm animals or agricultural equipment for members of the cooperative; with the creation and provision of competence centers.

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Digital Transformation of the Economy: Dividends and Threats

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Abstract The purpose of this article is to analyze the key conditions for the transition to a fundamentally new technological and socio-economic structure. Despite the intensive discussion that has been going on for more than a decade, the debate about what the digital economy is and what consequences society will face during digital transformation do not subside. Questions are raised about what benefits digital transformation will bring for all economic actors and why, despite the obvious technological, financial and social benefits created by the digital transformation of the economy, threats arise. The authors distinguish that there is no single definition of "digital economy", since it is impossible to determine the scale, benefits and risks, as well as the ultimate goal of building a digital economy. Based on the literature review held by authors some rules are proposed. The consequences of digital transformations affecting each economic agent in the system are systematized, in various planes of social life, bringing in economic, social, technological, political and other effects for each of the subject: companies, state and society. As now there is no single definition of "digital economy" the comprehensive analysis of this term held by authors can shed light on this topic.

Keywords Digital economy · Digitalization · Digital transformation · Consequences of digitalization

JEL Codes E71 · E02 · E44

1 Introduction

There is no doubt that in the modern world, the concept of digital economy has begun to be used more often in human speech. A distinctive feature and the actual

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purpose of the existence of the digital economy is the desire for efficiency, or in the other words—optimization. Not to maximization, as in traditional economics, but to optimization. This is a revolutionary new principle of economic relations, in which each subject strives for an optimal state, taking into account the same intentions of other subjects with which it interacts. As a result, an optimization balance of interests is achieved at a specific point in time for entities of various sizes—from households and enterprises, government, industries and the economy as a whole.

The transition to optimization as a goal of economic development requires the introduction of new business models based on the concept of product and service systems. The fundamental economic difference between such business models from traditional ones is that the consumer does not buy the product itself, but uses its functions to the extent and with the quality that he needs at a particular point in time, with payment based on their actual consumption or based on the results of their consumption. The fundamental technical difference is that the interaction is carried out not by human consumers, but by digital components of product and service systems, according to human-built algorithms, which minimizes the negative impact of the human factor on this process and allows the implementation of complex interaction algorithms, up to dynamic pricing in real time.

Why this is so, it is more logical to consider analyzing the origins of the origin, formation and development of digitalization.

2 Materials and Method

The term “digital economy” appeared not that long ago, namely in 1995, thanks to the American scientist from the University of Massachusetts, Negroponte (1995), who formulated the concept of the electronic (digital) economy (Fig. 1.1). He highlighted the advantages of the new economy over the old in connection with the intensive development and use of information and communication technologies (Tapscott 1994). A lot of time has passed since that moment, and the very concept of the digital economy has undergone many changes. Currently, there is no single definition of “digital economy”, since it is impossible to determine the scale, benefits and risks, as well as the ultimate goal of building a digital economy. The problem of systems analysis of the concept of “digital economy” is most fully reflected in the work of Bukht and Heeks (2017). Among the Russian authors who have dealt with this issue are the works of Nesterenko and Naumenko (2019) and Gribanov and Repin (2018). Nevertheless, within the framework of this article, I would like to focus on the official definitions or opinions of international organizations on this issue (Fig. 1).

The definitions that arose in the period from 1995 to 2012 are more similar in their description to similar definitions of the digital economy—informational, creative, Internet economy, networked, electronic. However, at the moment, the definition of the digital economy incorporates the features of not only all the economies listed above, but also a number of distinctive features. In order to correctly determine what

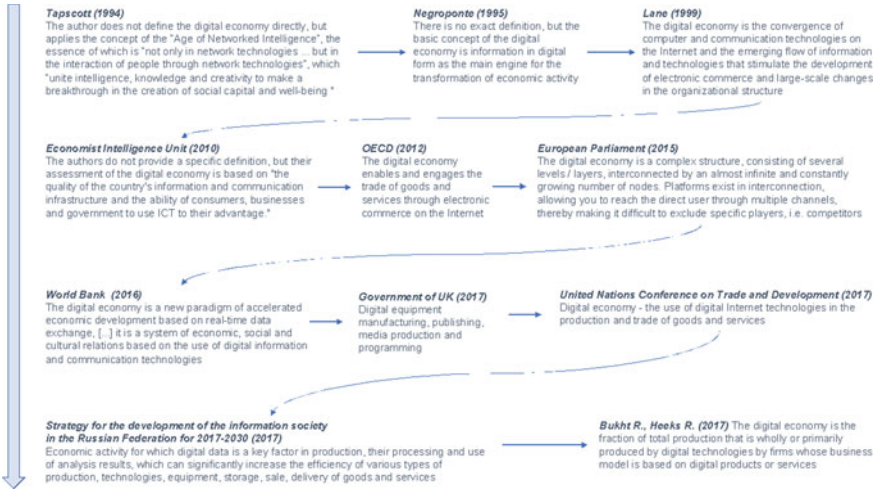

Fig. 1 Definition of the digital economy. *Source* Compiled by authors

the digital economy is all the same, you need to understand what the main features inherent in this concept are:

- Cutting technologies are being introduced into all areas of business, government and society
- The Internet is the key link through which the implementation of the digital economy is generally possible
- Information is the main object of exchange and trade between participants in the relations of the digital economy
- Digital infrastructure, which is the main way of transmitting information and distributing it among the participants in relations
- Digital technologies that contribute to reducing the role of humans in industrial production
- IT-technologies, with the help of which new markets are formed, including in a virtual environment.

Each country is fully subject to global trends in the development of digital technologies. Everyone needs to face the consequences of digitalization, which are already generating fundamental changes in the models of economic activity and social life in leading countries. And the faster the rate of introduction of digital technologies, the more difficult the tasks of managing the formation of the digital economy.

3 Results

Currently, insufficient attention is paid to assessing the digital economy, the expected results of its impact on the development of production, as well as measures to protect against possible losses when using end-to-end platforms and technologies. This is no coincidence, since the period of an unambiguous, positive assessment of the digital economy is gradually passing as a result of the emergence of real economic problems and difficulties. Based on the World Bank's digital adoption index, it can be seen that digital users are states, companies and society as a whole, while the digital adoption index for all three subjects of use hovers around 0.4–0.6. Consequently, about 50% of everything in this world, one way or another, interacts with digital technologies.

4 Discussion

However, the consequences of digital transformations affecting each economic agent in the system must be systematized. They will manifest themselves in various planes of social life, bringing in economic, social, technological, political and other effects for each of the subject.

Companies. A massive transition of companies to the digital field in the next few years is predicted for all sectors of the national economy. The transition of companies to digital technologies has a positive effect on their development:

Firstly, the automation of all production processes. More and more often in the world one can face such a situation when machines or automatic equipment displace a person from production. This is logical, since it not only increases labor productivity and the quantity of products produced, but also displaces such risk as the human factor. This happens mainly in large-scale industries due to the fact that new technologies for creating goods are developing.

Secondly, the digitalization of business processes shortens the "path from vendor to consumer": manufacturers themselves can enter the sales market, including the virtual one, using the Internet.

Thirdly, the acceleration of all business processes can be considered a positive synergistic effect of digitalization: now much less time is needed to make decisions; due to faster communication between the links of the chain from production to market entry, flexibility and high adaptability of production appear; simplification of the process of monitoring the opinion of the consumer and the growth of the reliability of such conclusions, there is a specification of products for the client's point request.

Fourthly, digital transformation in manufacturing can optimize costs and thereby improve operational efficiency (Economist Intelligence Unit 2010). The introduction of digital technologies presupposes a reduction in financial and energy costs, mainly due to the use of more and more autonomous, i.e., production and business processes that do not require direct human participation, which are characterized by

adaptability (self-optimization). At the same time, adaptability is based on the use of mathematical models describing the relationship of the metrics of these processes, with predominantly direct acquisition of primary data in the places of their origin from IoT devices and sensors, which allows to achieve high quality of incoming information (relevance, relevance, accuracy and completeness).

Finally, digitalization reduces potential problems when new production enters the market and expands trade. Companies can start their business quickly and with relatively low personnel and capital costs and expand their reach. Cloud services that provide computing and data storage services reduce the costs associated with starting a business, which also makes the company more attractive to investors.

State. The introduction of digital technologies into the public sector allows it, first of all, to provide its services more quickly and respond more quickly to various shock situations in the public administration system. The digitalization of many business processes at the state level increases the potential of the public sector, since economies of scale are realized and more and more citizens can take part in the political life of the country, follow the decision of the authorities.

The system allows the state to inform about possible changes in the country, and citizens, in turn, express their opinion about these decisions, as well as make their own adjustments. That is, an effective feedback system is being formed, which allows, first of all, to carry out measures of state policy more quickly and precisely.

The policy of digital transformation of power has significantly influenced the function of administration (European Parliament 2015). It is also worth mentioning that most of the socially significant public services have been transferred online, which allows (Government of UK 2017):

- Optimize access to all digital services provided by the government.
- Create optimal conditions for citizens to submit requests to obtain documents.
- Implement the fight against corruption and data falsification by monitoring the work of government bodies.

And finally, the transition to digital platforms that implement alternative to traditional technologies of interaction between the state and citizens, expands the participation of the latter in political life. Digital identity helps to overcome barriers for citizens to participate in political and public life. Many countries have introduced multifunctional digital identification systems or specialized electoral systems, which have increased the efficiency of the public sector.

Society. Digitalization is reflected in the landscape of the lifestyle of the population and society as a whole (Lane 1999). Recent events related to the pandemic have shown that a person, without leaving his house or apartment, can formalize his entire way of life, using a computer or telephone: from performing his duties at work to satisfying a wide range of needs: making an appointment with a doctor, training, theatrical performances and concerts, excursions, conferences, restaurants, etc. All this leads to the fact that the correct use of the advantages of the digital economy leads to an improvement in the quality of life of every citizen.

Risks. The process of formation and development of the digital economy cannot take place without a number of problems. First of all, digital transformation inevitably

leads to an increase in the cost of protecting information when using new technologies. Cybersecurity is an area that creates a huge potential for growth in the costs of supporting digitalization processes.

Essentially close is the problem of information indexing and its recognition as reliable. Deep fake technologies, originally developed for the entertainment industry, are now becoming a headache for many industries, political systems, national economies and global markets.

Another problem that is actualized as a result of the introduction of digital technologies is the shortage of personnel, as well as the need to create new skills and new competencies (UNCTAD 2017). At the same time, an asymmetric substitution effect will be observed: the creation of new production models will make a number of professions unnecessary, which will lead to an increase in unemployment. However, the discrepancy between the requirements for competencies and professional skills will not lead to mutual compensation of the two processes. Most likely, there will be a double deficit: a shortage of jobs in old professions and specialties and a shortage of highly qualified workers who can accompany the digital transformation of business processes in the real sector. And this, in turn, is an additional trigger for the development of social inequality.

In this situation, it should be understood that the acceleration of digitalization caused by new abrupt changes in the external environment, including the pandemic, has become a serious challenge for certain industries, including the IT sector. In this regard, the issue of the growing social responsibility of this industry and its readiness to perform the assigned functions at the appropriate level becomes especially acute. The speed and quality of transformation of products and services in this industry to meet the new demands of society have become of strategic importance. This is due to the current inefficiency of products and services presented in the markets, which can have serious negative consequences for the state and society as a whole.

At the same time, the paradoxes of the mobilization mode of development cause a sharp exacerbation of some "chronic diseases" associated with the development of digitalization. Moreover, they concern not only Russia, but also the world society as a whole (World Bank 2016). Including the following.

Firstly, many scientists began to note the existence of a crisis of trust in society, attributing this to the large amount of unreliable information present on the Internet. But if earlier, in most cases, it was associated with "unauthorized" sources and social networks, then in 2020 this crisis spread to the sphere of science and education.

Secondly, the lack of readiness to protect the security of personal data in electronic form has led to an increase in mistrust of the "digital state" model.

Thirdly, the change in the behavior model of employers, the blurring of the boundaries of personal space led to the fact that many began to view digitalization as a violation of a person's private life. Many trade union organizations in various countries have already reacted to this change and initiated the introduction of appropriate changes in labor legislation, but it is still too early to judge their effectiveness.

5 Conclusion

Therefore, based on the analysis of digital transformation processes, the following conclusions can be drawn:

a. The digital economy is not only the emergence of new digital technologies and their integration into everyday life, but also a change in the usual rules of doing business, the creation of new business models.
b. Digital transformation leads first of all to the optimization of transaction costs: the exclusion of intermediaries from the chain of selling goods, leads to the formation and development of the "institution of trust" of the client to the vendor, improves the transparency of many processes, which creates favorable conditions for the growth of business reputation. Another source of reducing the transaction costs of consumption is providing buyers with the opportunity to independently compare many offers at the same time (reducing the transaction costs of "information retrieval"), as well as customizing the selection of the optimal product or service (reducing the transaction costs of "measuring").
c. The development of digital technologies and digital platforms reduces administrative efforts and costs for the provision of state and municipal services, effective implementation of control and supervisory measures and improving the functional performance of organizations. public and municipal. Thanks to the proliferation of digital technologies and platform solutions, the quality and speed of service to citizens and businesses, the availability, adaptability of public services and the reliability of their results are significantly improved.
d. The processes of digital transformation also entail the formation of risks, which include, first of all, an increase in costs for digital infrastructure, a shortage of qualified personnel and cyber security.

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Digital Cooperation in the Russian Federation

Yaroslav S. Budarin, Dmitry K. Chirkov, and Firdousi B. Magomedov

Abstract The article considers the current state of digital cooperation in the Russian Federation and its negative side due to the infernality of the regulatory and legal regulation of the information segment of the digital economy by state authorities. Digital cooperation of the Russian Federation in its work refers to a set of technical and information tools that allow interested persons to pool resources and forces to achieve established common goals through information technologies. The main purpose of the article is to designate a legal omission made in the information segment of digital cooperation from the point of view of a threat to the national security of the Russian Federation. In order to achieve the indicated goal, the work uses the method of general scientific cognition–induction. Namely, the analysis of the private positions of a number of leading foreign and domestic scientists, as well as political figures of the Russian Federation, analytical information of international organizations is carried out. The main message on digitalization issues is summarized taking into account world experience and a conclusion is made on the current state of digital cooperation in the Russian Federation. In the course of studying the materials used, omissions were identified that entail a threat to the sovereignty of the Russian Federation. The identified prerequisites of the threat to the national security of the Russian Federation are the result of a misunderstanding by the institution of state power of role in the digital segment of the information infrastructure. Which greatly contributes to the usurpation of existing state authorities and local self-government. This is primarily due to the lack of effective legal and technical mechanisms for regulating the information infrastructure of the Russian Federation among state authorities.

Keywords Digital cooperation · Digital economy of the russian federation · Information infrastructure · Information technology · National data management system · State construction

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1 Introduction

> There is no competition for goods, products or services. There is competition of management models.
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> H. Gref

Public authorities are attempting to use the latest advances in science and technology to make better use of resources. However, unfortunately, the inefficient distribution of information data and the lack of technologies, and most importantly, ideas that allow you to structure, systematize, standardize and target information flows in real time on a single platform in a single infrastructure of the state, as well as regulatory omissions in the legislation of the Russian Federation create prerequisites for increasing social tension in the information society. This is primarily due to the outdated paradigm of public administration, which loses the adaptive properties of the social and public regulator in the conditions of a constantly accelerating turnover of the information environment, which, in turn, has become the main basis for social interaction.

This problem is increasingly reflected in a number of high-profile events taking place in the banking segment, credit consumer cooperation with the leakage of personal data of customers and employees, the situation with the COVID-19 pandemic, as well as the spread of criminal communities in the information infrastructure and other lesser-known events violating the constitutional rights and freedoms of citizens of the Russian Federation. That is why the topic of digital cooperation of the Russian Federation, which is a derivative of most of the indicated problems, was raised to study problematic issues.

In order to study the issues in this work, the materials of the article were used: S. Lafortune from the ANNUAL REVIEWS magazine, Department of Electrical Engineering and Computer Science, University of Michigan, "Discrete Event Systems: Modeling, Observation, and Control" which revealed the technical features of the functioning of autonomous systems and modeling processes of control systems. This article allows you to disclose the processes of automated adaptation to asynchronous events, which applies to public administration and provides an opportunity to project the interaction of society in the digital model of the state. Therefore, in order to identify the key disadvantages of the current electronic government in the Russian Federation. In addition, the works of S. Zemtsov from the "Forsite" magazine of the National Research University of the Higher School of Economic—"Risks of digitalization and adaptation of regional labor markets in Russia," which revealed the main features of the ongoing digitalization in Russia and the main risks for the regional labor market, were used. It allows us to consider the issue outlined in the article from the point of view of macroeconomic interpretations and consequences for the labor market. The most important material used in the article is the work of A. Friedman from the scientific and theoretical journal "Fundamental and Applied Research of

the Cooperative Sector of Economics" of the Russian University of Cooperation—"Consumer Cooperation in the Context of the Formation of the Digital Economy" (Friedman 2018). The work of A. Fridman, professor of the Department of Economics at the Russian University of Cooperation, reveals the key advantages of cooperative ideology in the context of the formation of the digital economy of the Russian Federation, and highlights the main advantages of management through the consolidation of the efforts and resources of the cooperative community. Which, in turn, reveals some positive aspects of digital cooperation, but at the same time does not focus on the interests of the Russian Federation in the context of national security. In addition, the work used the material of M. N. Khokhlova—"Expert Opinion on the Draft Decree of the Government of 01/08–19/00093985," which reveals the infernal sequence of actions of the subjects of legislative initiative in the field of digital transformation of the Russian Federation and considers some possible options for the technical implementation of electronic government. Material from a speech by N. V. Zubarevich at a meeting of the Federation Council of the Russian Federation on December 11, 2019, which describes the general negative dynamics of the development of business entities, which clearly contradicts the conceptual basis of digital cooperation and is not related to reports on the digitalization process of the Russian Federation.

Empirical data of the index of self-isolation are analyzed during a pandemic COVID-19 and a series of normative legal acts of Administration of the President of the Russian Federation, the Government of the Russian Federation in the part concerning the organization of a quarantine and the counteraction to COVID-19 virus showing a weak technical component on account, identification and objective control of natural and legal entities of the Russian Federation. In addition, the material of the following authors was studied: N. P. Nosova, Y. S. Budarin, D. V. Menyaylo, Yu. A. Ivanov, which revealed the features and variations of the violation of the national security of the Russian Federation through information technologies.

All this emphasizes the importance of the issue of digital cooperation (and information security) and, together with the previously identified theses of leading scientists and politicians, allows us to formulate the following study hypothesis—regulatory regulation and technical implementation of electronic government do not provide the necessary level of digital cooperation of the Russian Federation as a beneficiary of digital infrastructure.

2 Methodology

In the context of the formation of the digital economy of the Russian Federation and due to the lack of effective regulatory and legal regulators in the field of providing the Russian segment of the information infrastructure with state authorities, digital cooperation using information technologies is becoming increasingly relevant among the population. Therefore, in work "Consumer Cooperation in the Conditions of the Formation of the Digital Economy" 2018, Doctor of Economic sciences, A. M.

Friedman, Professor of Economics at the Russian University of Cooperation, emphasizes that "the program of the Government of the Russian Federation in the field of the formation of the digital economy creates the necessary conditions for improving the mechanism of interaction between economic entities," and also notes that "as we move towards a digital economy, many traditional spheres of activity and professions are transformed. In particular, transport, trade, finance, law, management, etc." (Friedman 2018). However, the data provided on December 11, 2019 by Professor of the Department of Economic and Social Geography of Russia of the Geographical Faculty of Moscow State University named after M.V. Lomonosov, Doctor of Geographical Sciences N. V. Zubarevich at a meeting of the Federation Council, interpret the general negative dynamics of the development of economic entities (Federation Council of the Federal Assembly of the Russian Federation 2020). This to a certain extent creates an obvious contradiction, and whether digital cooperation works correctly in the digital economy.

There is no doubt that digital cooperation, like consumer cooperation, is an important component of the economy of our country, but in the context of creating a digital economy, this phrase acquires a special status, since the share of economic entities in the information environment is growing exponentially. There is a situation where digital cooperation from the field of interaction of physical and legal persons can be transformed into the field of political movements or criminal communities. And based on the peculiarities of information technologies, this process can occur uncontrollably for the state institutions of power of the Russian Federation.

The most dangerous thing is that criminal communities are actively involved in this process, cells of the criminal group A.U.E. are being created everywhere. In particular, the monitoring of the A.U.E. subculture on the VKontakte social network, conducted by S. G. Dzikonskaya and O. O. Grabchak, demonstrates that about 42 publics dedicated to A.U.E. were found, in addition, it is difficult to estimate the number of community data in the information sphere inaccessible for monitoring (Telegram, WhatsApp, Signal, Viber, encrypted mail aggregators and other cooperation tools of interested The target audience of this organization is young people from 13 to 17 years old, mainly from disadvantaged families. Today, based on the available data, about 6,919,333 people are members of the communities, which indicates that every young citizen of the Russian Federation at least heard about this subculture (Menyaylo et al. 2019). Prevention and preventive measures on this issue do not have a high effect, since the plane of interaction and coordination of actions lies in the information infrastructure, which is not under the control of state institutions of power. The main distinguishing feature of this subculture is the coordination of actions in the digital environment and the justification of criminal activity.

In addition, easy earnings are gaining high popularity through the Internet with the help of social networks and other forms of cooperation of potentially interested citizens of the country, where when performing special tasks (transfer bookmarks, violate the confidentiality of a certain person, etc.) the performer receives a financial reward. The main audience of the impact is the population of a low-income country, the proposed amounts for fulfilling simple tasks are 50–100 thousand rubles. This

activity is a derivative of the functioning of DarkNet and Deep Web in the Russian Federation.

In addition, the situation is aggravated by the lack of state technological and regulatory control over the electronic segment of interaction. So, for example, situations have repeatedly arisen in state banks, government agencies with information leakage, as well as periodic failures in software provided by organizations outsourcing the information infrastructure of government institutions. All this leads to a loss of confidence on the part of citizens of the Russian Federation, small and medium-sized businesses.

This highlights the pressing issue of e-government construction. In this regard, a proposal was developed and submitted to the Presidential Administration of the Russian Federation "Comprehensive Initiative on the Digital Economy," which reflects the main theses of the development of the information society and e-government. What together reflects the disadvantages of the current management model—bureaucracy, lobbying, the absence of identifiers and technical? e-government legal framework. Following the consideration, a response was received from the Ministry of Digital Development, communications and mass communications of the Russian Federation, that at the moment a number of systems are being created within the framework of the national project "Digital Economy," Thus, within the framework of the program, the Ministry of Communications of Russia, together with the Ministry of Economic Development of Russia and the Analytical Center under the Government of the Russian Federation, is currently working on the implementation of a project to create a National Data Management System (hereinafter DMS). The principles of the DMS are aimed at monitoring the quality of data, unifying the requirements for their management, providing state data once for further reuse, as well as the accessibility of work with state data to a wide range of users by forming a single "ecosystem" that ensures mutually beneficial cooperation with bodies and organizations of the state and non-state sector. As noted from the response to the appeal, with the help of the National Data Management System, existing barriers will be eliminated, which make it difficult to carry out events to improve the quality and effectiveness of working with state and other socially and economically significant data. At the same time, it is noted that the development and approval of the regulatory framework of the National Data Management System is planned for 2020–2021, as well as its refinement and testing of the main functionality. The concept of the creation and functioning of the National Data Management System was approved by Order of the Government of the Russian Federation dated June 3, 2019 No. 1189-r.

Analyzing the received response and analyzing the submitted regulatory act, we can conclude that that the system will operate without uniform forms of identification of public servants, in other words, data in this system, if necessary, can be falsified by anyone and whatever, since civil servants will be able to drive false information without identification in a single information infrastructure, thereby turning state statistics and information into formalism, in addition, the absence of a responsible performer for the creation of this program will lead to low profitability and quality of its implementation. The architecture and principles of the National Data Management

System do not ensure the proper reliability of the information infrastructure of state authorities and local self-government, but are a technical crutch that will lead to disruption of public administration. This is due to the lack of a technical base that allows the delivery of information between the subjects of interaction. Leveling this functionality and storing data of private intermediaries creates prerequisites for fundamental technical errors. Which in the system of state construction can be described as fatal. In addition, the experience of N. Wiener set forth in "La formation du paradigme cybernétique: varias et devenirs en psychopathologie" is not taken into account. In particular, it is not taken into account that cybernetics, in the context of public administration, is an "organized social system" and is "a connected communication system that has dynamics, and cyclic processes with a given sequence play a large role in it" (CCSD 2014). Using this in practice in the National Data Management System would optimize the functioning of the national data management system.

Such a situation in the information field of interaction between institutions of power and public entities clearly demonstrates that one of the key problems at the current stage of development of state regulation of information systems is the lack of clear guidelines for the regulator himself and an understanding of where his own interests pass and the necessary participation in ensuring the proper maintenance of the information infrastructure of Russia, where the boundaries of scientific innovative economic entities. In addition, it can be noted that the implemented public services platform does not periodically function, this leads to inconvenience when paying taxes, fines and using other services, while no one provides compensation for late payment. Under such conditions, the situation turns into uncontrolled. The new appearance of state authorities becomes negative in the eyes of the citizen.

The dilemma of this situation is to abandon the existing mechanisms of interaction with citizens and create an effective platform for interaction between the population and the state or to follow the chosen path and create "information and technological crutches" that do not meet the minimum needs of the population and the state in new realities, and even more so in the way of promising and sustainable development, do not provide reliable functionality information infrastructure (Nosova and Budarin Ya 2018).

As a result of this misunderstanding, the Russian authorities for a long time do not differ in the sequence of decisions made, and the regulatory acts adopted are not effective for any sphere. The information field was no exception, the analysis of the legislative framework showed that the authorities did not optimally prioritize information security.

It can be noted that the legislative framework in matters of information policy is not ready to fully ensure the interests of users of the Russian segment of the Internet.

At the same time, the amendments to the Constitution of the Russian Federation, to article 71, adopted on July 1, 2020, "are under the jurisdiction of the Russian Federation:… ensuring the security of the individual, society and the state in the use of information technologies, the circulation of digital data," suggest that the institutions of state power have embarked on the path of consolidating information technologies through legislative tools. But at the same time, many questions remain about which

vector will be further developed. A vivid example of the absurdity of correct decisions and unnatural algorithms for the introduction of new management mechanisms is electronic government. This is confirmed by the published data of the OECD Digital Government Index (DGI): 2019, where the Russian Federation did not enter the top 35 (OECD 2014, 2019) countries with the best electronic government. In addition, analytical data DataBank Worldwide Governance Indicators, which reflects the data of Government Efficiency: Estimate, emphasize the low efficiency of public administration in Russia when empirically compared with other countries.[1] The Government of the Russian Federation, in terms of the level of perception by citizens of public services, the quality of public service and its degree of independence from political pressure, as well as confidence in the policies pursued by the Government, is at the level of Montenegro, Greece and Kazakhstan. This emphasizes the inefficiency of the state-building tools used, in the context of the Digital Economy of Russia.

Subjects of the Russian information policy, not feeling support and guarantees from the state in matters of ensuring information security and other threats to the information infrastructure, are gradually co-operating on servers of foreign origin, where there is a guarantee of data protection and a pragmatic regulatory framework. Such servers have quickly become relevant among physical and legal persons who know digital threats, in addition, sites are created where users can access cheaper digital products, as well as instant messengers that allow sharing information without the threat of disclosure.

Of course, from the experience of implementing consumer cooperation in the macroeconomics of the Russian Federation, it can be concluded that in Russia this area of activity occupies a special place and in all respects can be called its legal offshore zone of the state economy (Zemtsov et al. 2019). Entrepreneurs at the expense of these associations receive various tax benefits, legally purchase goods at lower prices, and also sell other favorable transactions using the "white zones" of Russian law. In such conditions, a logical question arises: how will digital cooperation be realized in the context of the formation of the digital economy of the Russian Federation? At the moment, there is a clear answer, the subjects of the legislative initiative will allow legal persons, as beneficiaries of the information infrastructure, to consolidate information to the volume of critical data, which will lead to the loss of the need for the subjects of the legislative initiative.

Formalism in the field of informatization of society is gaining more and more circulation, where the introduction of Chinese cheap gadgets with a label from Russian manufacturers is hiding under large slogans and large transactions, and the robotization process is absurd, and animators are presented at exhibitions to justify the costs of this area. Against this background, the question of trust in institutions of power arises for ordinary citizens, it is in this context that the issue of digital cooperation in the digital economy should be considered.

[1] THE WORLD BANK, DataBank Worldwide Governance Indicators, Washington, USA, https://databank.worldbank.org/source/worldwide-governance-indicators/Type/TABLE/preview/on (date accessed: 18.10.2020).

The research showed that the regulatory framework of state-building in the field of informatization does not show sufficient flexibility to a dynamically developing world. The legislative framework, in particular, the Doctrine of Information Security of the Russian Federation, approved by Decree of the President of the Russian Federation of December 5, 2016N 646, Federal Law of July 26, 2017N 187-FZ "On Security of Critical Information Infrastructure of the Russian Federation," Federal Law "On Personal Data" July 27, 2006N 152-FZ, being fundamental in the field of information technology, do not lay the dogmas of information security of citizens as the basis of the national security of the Russian Federation. The main priority in these regulatory documents is the quintessence of information security, but the mechanisms for its implementation are not determined, as a result, a citizen in the information sphere belongs to himself, and his personal data to subjects of various jurisdictions. At the same time, at the moment, it is already a well-known fact that manipulation of personal data of a person contributes to discrimination of society as a rational subject of civil interaction.

Modern history knows many vivid examples when skillful manipulation of information led to a distortion of facts and a change in the mindset of people, vivid examples are conflicts in Yugoslavia, Libya, Yemen, Ukraine, an attempted coup in Turkey, and the most striking example of information impact is the genocide in Rwanda and the role of Free Radio of thousands of hills in its tragic development. All this determines the high importance of security in the information sphere, and the foundation of this security is a citizen. By ensuring the information security and predictability of the country's policy towards citizens, the State will be able to hope for a firm basis in domestic policy (Nosova and Budarin Ya 2018).

Abstracting from the means of management in the field of information policy, the Russian Federation loses state sovereignty. Returning to the topic of digital cooperation in the Russian Federation, we can conclude that under the current conditions of the implementation of the state program, digital cooperation is becoming chaotic, in addition, the loss of control over the data of citizens of the Russian Federation will lead to the usurpation of power and the liquidation of the state institution as an unnecessary appendage.

3 Results

In the process of implementing the state program "Digital Economy of the Russian Federation", the general public has many questions about the current legislative framework and issues of state-building of "electronic government." So, for example, M.N. Khokhlova, a member of the expert council at the State Duma of the Federal Assembly of the Russian Federation, in an expert opinion on the draft government decree "On the creation of unified requirements for a unified technological architecture of information systems of state authorities", expressed the opinion, that in the current situation of information development of public authorities, taking into account the proposed solution and the problems encountered, the draft resolution

erroneously proposes unrealizable organizational and command methods of "manual" archaic document-oriented management of the unified architecture of information systems of state bodies (Khokhlova 2019). This conclusion is primarily due to the lack of effective regulatory and legal instruments and effective technical mechanisms in the field of providing the Russian segment of the information infrastructure with state authorities, where digital cooperation using information technologies is becoming increasingly relevant.

The identified problems are emphasized by frequent mechanical failures of the public services platform, the suspension of interagency interaction systems, the ineffective work of the Federal Portal of Draft Regulatory Acts, technical failures in paying taxes, fines and other more private problems that together form the appearance of the electronic government of the Russian Federation (Nosova and Budarin Ya 2018).

At the same time, the regulator of legislative law makes incorrect changes to the regulatory framework, for example, consideration of bill No. 763517-7 "On Amending the Federal Law "On Information, Information Technologies and on Information Protection" and Article 18 of the Federal Law "On personal data" "in the State Duma Committee on Information Policy, Information Technology and Communications, this led to the collapse of shares of the Russian transnational company Yandex by 10%, which resulted in the loss of more than 100 billion rubles of capitalization. Which emphasizes the infernality of actions and decisions taken at the state level in the digital segment of civil interaction.

The situation is confirmed by separate statements by the Chairman of the Federation Council of the Federal Assembly of the Russian Federation V.I. Matvienko on the progress in the implementation of the national project "Digital Economy," which was not even implemented by 15% as of September 25, 2019, that such a state of affairs is unacceptable and it is necessary to mobilize resources and funds to solve the current problem in the digital sphere.

The digital cooperation of the Russian Federation under the current conditions becomes the main tool for implementing a multi-stage management model taking into account the achievements of the network-centric concept. In this regard, it is important to consider foreign experience in the digital environment.

An analysis of the regulatory framework of foreign countries shows us that the issue of ensuring the activities of electronic government, as well as digital cooperation, has been brought to a special state level, data protection is based on a comprehensive approach to ensuring the information security of physical and legal persons.

It can be noted that the field of information security is the most important issue of international law, the development of digital technologies only tightens the requirements for security issues.

Priority is given to the legislative and technological framework. International experience in this field knows many examples and is embedded in the fundamental foundations of state-building:

- "Data Protection Act", Germany, 2001;

- "Act on Access to Information Administered by Administrative Authorities" No. 42, Japan, 1999;
- "Information Security Management Act", USA, 2002;
- "Secret Information Act", Bulgaria, 2002;
- "Electronic State Act", USA, 2002 (Nosova and Budarin Ya 2018).

It is worth noting separately that the infrastructure responsible for the functioning of the information sphere of e-government is under state control, which emphasizes the special role of the subject of legislative initiative (Castells 2000; Johnson 2001).

In this way, a unified and transparent management is achieved, which allows for a more flexible and targeted policy on physical and legal persons.

This situation is reflected in the study of Discrete Event Systems: Modeling, Observation and Control, where, using the example of autonomous systems and simulation of control systems, it is illustrated how the computer finds a way out of a non-standard situation (Lafortune 2018). Which clearly demonstrates the high importance of the practical application of computers in the functioning of state institutions. Digital cooperation in this context takes on a special role as a subject of the concentration of identifiers, events and algorithms.

World practice demonstrates that information cooperation mechanisms for doing business are actively used. The scale of cooperative networks is also indicated by turnover. If Carrefoor-Europe's net profit in 2019 was 579.7 million euros, ASDA—495 million euros, Tesko-Europe—2.60 billion euros - these are all stores of the well-known retail chain, then the income of the European group Euro-Coop for the same year amounted to 79 billion euros.[2,3,4] Which indicates a high-efficiency use of digital cooperation tools. There is also a dark side to digital cooperation, for example, there is also the use of innovative technologies by criminal syndicates. In particular, foreign countries became the founders of the so-called DarkNet, Deep Web, where the development of digital technologies allowed the implementation of a "parallel" Internet network for criminal activity. In particular, this network sells illegal drugs, weapons, stolen goods, coordination of criminal and other activities that are not legal. At the same time, it is important to note that the information infrastructure of foreign countries is under the control of the institutions of power, unlike the Russian subjects of the legislative initiative.

[2] TescoPLC, Highlights, Welwyn Garden City, United Kingdom, Режим доступа: https://www.tescoplc.com/investors/ (дата обращения: 15.09.2020).

[3] Invest in CARREFOUR, Financial EVENTS, Boulogne-Billancourt, France, https://www.carrefour.com/en/finance (date accessed: 9.11.2020).

[4] ASDA, Company Facts, Leeds, United Kingdom, https://corporate.asda.com/our-story/company-facts (date accessed 20.10.2020).

4 Conclusion

Unfortunately, we have to state that the approaches of state authorities in digital cooperation of the Russian Federation are cut off from the actual state of the information segment and are considered exclusively as an independent tool of interaction. The lack of effective regulatory and physical tools in the information infrastructure of state authorities leads to the consolidation of existing problems. Such a situation creates prerequisites for violating the information sovereignty of the Russian Federation, provides an additional incentive for development for the criminal community and provides opportunities for third countries to influence the citizens of the Russian Federation. Do not forget the main thesis of the definition of cooperation. Cooperation is a form of society's reaction to the exploitation of the owners of labor capital, its formation is based on the absence of regulatory and legal mechanisms for protecting the population in the labor sphere (Friedman 2018). Interpreting this definition to modern reality, it turns out that the institutions of government have not created conditions for comfortable interaction of all members of society and they have to unite in specialized associations in order to minimize the imperfection of legislation, legal and bureaucratic mechanisms. That is why destructive subjects of information infrastructure are being created, which are aimed at discriminating against public authorities. First of all, this is reflected in the regulatory framework, which is filled with conflicting functions of the regulator and does not answer the main question: who is the main guarantor of information security of private and legal persons, and the monopolist of a single information infrastructure? The process of formation of the digital economy of the Russian Federation, theses of leading politicians and scientists suggest that the regulatory regulation and technical implementation of electronic government do not provide the necessary level of digital cooperation in the Russian Federation as a beneficiary of digital infrastructure. The information sphere does not forgive such mistakes and creates prerequisites for the usurpation of state authorities.

Therefore, the issue of digital cooperation in the digital economy at the moment should not be considered as an option to simplify the interaction of members of the community, but as a form of an immediate threat to the national interests of the Russian Federation under the current paradigm of public administration. In another interpretation, it is worth taking as a basis the Smart World management model, which will be disclosed in detail in subsequent studies. "Smart World" is a set of digital cooperation in a network-centric model of society management, which allows, through innovative technologies, to distribute resources, means, opportunities among all subjects of interaction in a single information and commodity-market environment, defined by given algorithms aimed at the development of a knowledge society. In this way, the most important task of humankind in self-determination will be solved. Many skeptics will notice that this idea will lead to total control, and will be to some extent right. However, it is worth noting that the dogma of permanent verification is not fundamental, it is only a derivative of the commonality of the systems of functioning of the state without the possibility of external and internal factors influencing it. What in practice will lead to the rational development of state

and public institutions, will exclude negative factors of bureaucracy and lobbying, and will also create prerequisites for the development of public society in the direction of the knowledge society. At the moment, the experience of state construction of the digital economy of the Russian Federation demonstrates the general negative dynamics of the development of the innovative sector of the economy and the regulatory framework of Russia.

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The Role of Cooperation and Collaboration in Digital Environment for Sustained Economic Growth

Lyudmila S. Chikileva

Abstract The purpose of the chapter is to demonstrate advantages of collaboration in digital environment and show the importance of educating qualified professionals for sustained economic growth. The research was based on the qualitative approach. Data were obtained from the survey. The author analyzed the data, using the method of semantic interpretation. The methodological basis of the research is the theory of human capital in the context of the sustained development. The results obtained in the research show that the implementation of cooperative learning in digital educational environment has advantages as it increases motivation, promotes collaboration and allows using new management tools. The transition from traditional classroom teaching to remote one requires formation of soft skills, acquisition of digital competencies, development of professional skills that will make qualified specialists more competitive in labour market. The results of the research are useful for determining perspectives for more efficient cooperation and collaboration in digital educational environment which will enable formation of the competencies required for qualified professionals. The study has proved that cooperative learning motivates students and has significant potential for effective distance learning.

Keywords Sustainable economic growth · Cooperation · Online forums · Distance learning · Cooperative learning · Competencies

JEL Codes I21 · I23 · J24 · O10 · A22 · A11

1 Introduction

Steady development of economy depends on numerous factors. One of the most important of them is qualified professionals. University graduates should be ready for life-long learning, and they should be ready to improve their skills and competencies. Unexpected changes happening in the world, due to consequences of the coronavirus,

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are destructive. Covid-19 has caused a crisis in global economy and markets. The virus has been declared a global pandemic. It has a global impact and destabilizing influence on world economy. No matter how dangerous the consequences of the coronavirus may be, measures should be taken to support sustainable economic growth. Qualified professionals having soft skills are more competitive at the labour market.

Due to current changes in the system of higher education, special attention is given to new methods and tools (Artino 2010; Kalugina and Tarasevich 2018; Kim et al. 2011; Lee et al. 2014; Ark 2016; Chikileva 2018). Nowadays, new approaches are used in teaching foreign languages that may be very useful both in classroom setting and in students' autonomous work (Sharpless et al. 2007; Musavi 2011; Liton 2015). These approaches are more creative compared with traditional ways of teaching. The forms of teacher-students' interaction are also changing. As digital technologies are developing rapidly, there is a tendency to use various methods based on students' cooperation and collaboration (Melnichuk and Osipova 2017). The implementation of cooperative learning is especially efficient in the period of Covid-19 crisis. As students have to study from home, remote learning has become popular at non-linguistic Universities and at the University of Cooperation in particular. It presents certain interest to consider new ways of teaching a foreign language and analyze students' opinions about cooperative learning and about various forms of their collaboration in the process of study.

2 Materials and Method

In order to achieve the aim of the research and to find out students' points of view about the usefulness of cooperative learning, we used the following methods: a survey, data analysis and the interpretation of the data. We asked students to express their points of view, concerning cooperative learning. The number of students who took part in the survey was 126. They were junior students who studied English as a foreign language at a non-linguistic University. The survey was in their native language. There was no need for students to write down their names and surnames. The students were to express their opinions about the following statements: (1) I find cooperative learning useful and motivating. (2) I am satisfied with the results of cooperative learning. (3) I need my teacher's help and instructions to achieve better results in cooperative learning. (4) It would be helpful to develop writing skills using electronic educational environment in the process of cooperative learning. They could use the answers from one to five to denote various degrees of their agreement and disagreement: (1) strongly agree, (2) agree, (3) neutral, (4) disagree, (5) strongly disagree. The research had two stages. At the first stage, it was necessary to define the aim of the research and its objectives, to develop a hypothesis and choose methods of the study. During the second stage, we analyzed and systematized the data and made conclusions.

3 Results

Let us start with the definitions of the terms "collaboration" and "cooperation". Collaboration means such a situation or process when two or more students complete some educational tasks together or participate in some educational activities in order to realize a plan or achieve a certain aim. It implies leadership, though forms of leadership may be different. Moreover, if it is team work, team members usually have the same vision, their vision is shared. They have to discuss what decision should be taken in order to realize their goal. Collaboration means that every participant of the group is interested in the result, so the interest is shared. Though terms "collaboration" and "cooperation" are similar, there is some difference between them. Cooperation means something different from collaboration. In this case, two or more students have to fulfil educational tasks together in order to support various goals. For example, it may be a group member helping his or her friend with presentation. The main thing is that it is not necessary for them to have a shared vision. Cooperation therefore can be defined as such a process when students have to do certain tasks individually and then share the results with the rest of their small group who can help them with advice. Cooperative learning may be very useful as students with different levels in a foreign language can upgrade their level in the process of collaborative work. It is very important for students to be able to work in collaboration and cooperation. It will help them to be more effective in team work in their future professional activities when they have to combine a collaborative environment with a cooperative environment, have a shared purpose that is considered to be the main driver of collaboration and cooperation. Cooperative learning implies dividing students into smaller groups for their efficient collaboration in the process of which they are able to help each other to achieve better results. It is considered to be an effective teaching strategy, in such a way it can be implemented in distance learning. Cooperative learning has the following advantages. Even though students work in a small group, they have personal responsibility for the achieved results as each of them has a personal task within a group task. They can develop their communicative and social skills in the process of cooperative work. Besides, they can develop soft skills, including social skills, empathy, patience, time management, leadership, emotional intelligence, critical thinking and some others. Though teaching a foreign language is mostly student-centered in a digital learning environment, it is evident that collaboration and cooperation of students both in class work and in autonomous work in particular can make language learning more interesting and bring good results.

The aim of the research was to determine the role of cooperative learning in motivating students, give language learners an opportunity to have collaboration and make students' autonomous work in digital environment more efficient. The study had the following tasks: make sure whether students find cooperative learning useful and motivating; find out if language learners are satisfied with the results of cooperative learning; determine perspectives of cooperative learning in digital environment.

The hypothesis was as follows: students find cooperative learning exciting and motivating; language learners are always satisfied with the results of cooperative learning; students need teachers' instructions to be more successful in cooperative learning.

The results of the survey have shown that the majority of students participating in cooperative learning agree that it is motivating and useful, so they have chosen the answers "strongly agree" or "agree". As it is a new kind of activity for them, they find it exciting. However, about one third of students are not always satisfied with its results. Students have different levels in a foreign language therefore some students whose level is lower can face certain problems when they have to work in a team. As a result, they are not satisfied with the result of their work. Concerning the third statement about the teacher's help, two thirds of the students agree that they need teacher's instructions for achieving better results. It is not surprising that they need the teacher's support because their level of English may be elementary or pre-intermediate. If they have their teacher's support, it is much easier for them to understand the task and cope with it. As for the last statement "It would be helpful to develop writing skills using electronic educational environment in the process of cooperative learning", the answers are various. Some students (25%) have chosen neutral answers—they neither agree, nor disagree. Nearly the same number (23%) do not agree with this statement, among them 15% disagree and 8% strongly disagree. The remaining 52% are positive about upgrading their writing skills in the digital learning environment (27% strongly agree and 25% agree). The hypothesis that students find cooperative learning exciting, motivating and need teachers' instructions to be more successful in cooperative learning has been confirmed. However, they have not completely confirmed the statement that they always feel satisfaction with the results of cooperative learning. It means that teachers could use more various methods and tools, use student-centered approach to make cooperation in digital environment more efficient.

It is obvious from teaching experience that learners can achieve better results in class activities and in autonomous work if they have an opportunity to participate in the process of CLL (cooperative language learning). Cooperative learning is an approach in teaching that implies using cooperative activities when students are to work together in small groups. Teachers organize group activities in such a way that there are social contacts between the learners in small groups. In this case, students are accountable for the results of their learning and they help their group mates to achieve better results. Teachers have the following objectives: give students a chance to get the experience they need for cognitive and social development; promote positive relations within the groups; organize the process of a foreign language acquisition using interactive activities; create a friendly environment for successful learning; eliminate stress and anxiety; motivate students to achieve better results.

Much attention is given to the interaction between the teacher and students. This interaction is a dynamic process. Teachers develop the creative potential of their students and create educational environment for the development of individual potential of every student. It is very important for a teacher to be optimistic, enthusiastic, be able to arouse students' interest in their subject, motivate and encourage them.

It seems to be necessary to enumerate the reasons hindering interaction between teachers and students:

- students do not take into consideration their teachers' requirements; they ignore these requirements and the teachers' comments.
- teachers treat student subjectively, with prejudice;
- teachers do not take into consideration individual characteristics of their students.

In order to make the psychological climate better, it is important to involve students in the process of cooperative learning when a teacher becomes a facilitator who motivates students and creates friendly atmosphere in the team. In this case students make progress much faster, more efficiently and achieve better results. The teacher's instructions are helpful for half of the learners, especially for those whose level is elementary or pre-intermediate. Moreover, students' participation in cooperative learning is of great importance for the integration of their personal efforts. Teachers can easily monitor various stages of learners' individual and cooperative activities, especially their written work, in digital educational environment. It seems to be efficient to use forums for cooperative learning, especially in distance learning. Teachers can get in touch with their students in forums and have access to their homework if it is attached and available there for correction. Using forums, students can discuss various topics in a foreign language therefore they can improve their communicative competence. It is convenient to use forums for collaborative writing as students have a chance to compare their writing with the results of their group-mates. Students can take part in peer-review process within groups consisting of four or five students. Their task is to analyze the essays of their peers for content, grammar, organization and style; evaluate and suggest how to improve them. They can use internet sites for automatic correction. The next task for students is to write the final version and turn it in to their teacher. Teachers can motivate students to use online forums, give instructions how to do it in the most efficient way and use it as a pedagogical management tool (Chikileva 2019). Teachers can use technology for making cooperative language learning more efficient. The main reason for using technology in cooperative learning and in autonomous work is to upgrade the educational process. Moreover, teachers can encourage students to manage their time properly, to do autonomous work in collaboration, to use forums of their groups. Cyprus considers that forum is an area for discussion on a website (Cyprus 2010). An educational online forum may be used for students' cooperative learning and autonomous work. It is convenient for students to use forums as storage where they can keep their essays for peer review. Moreover, students can use forums for exchanging their ideas in the process of collaboration, it may be synchronous or asynchronous communication. An online forum is digital communication space that can be regularly used in educational process. The usage of online forums can increase the effectiveness of communication and motivate students for cooperative learning. Teachers can use forums as the area for cooperation and collaboration, they can get feedback from their students at any time and in any place.

New forms of student–student and teacher-students' collaboration and interaction may be used at the lessons or webinars and in autonomous work. Due to Coronavirus and numerous changes in educational system connected with isolation, it is hard to

predict if distance learning will become the main form of education in the future. Nobody knows exactly when students will be back in their classrooms and if they will be able to study not only in digital space but also in a more traditional educational environment. No matter what type of education we are going to have, students should have social and communicative skills necessary for their future professional activities. Teachers can use technologies for making language learning more effective. Students can develop their competences in the process of doing autonomous work in collaboration with their groupmates, and their motivation will increase.

4 Conclusion

The results of the research are useful for determining perspectives for more efficient cooperation and collaboration in digital educational environment which will enable formation of competencies required for qualified professionals. The conducted research has proved that cooperative learning motivates students, and it has significant potential for effective distance learning. In order to take proper actions concerning human capital and its management, new realities should be taken into consideration (Fenech et al. 2019; Vineeta 2017). Nowadays it is essential to prepare qualified professionals who have not only professional skills, but who also have soft skills, and who are able to cooperate in changing work conditions.

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Consumer Cooperation in the Digital Economy

Konstantin A. Kartashov, Evgenia L. Chechetka, Victoria G. Bush, Irina G. Peshkova, and Asya E. Arutyunova

Abstract In the context of digitalization of the economies of the world, the cooperative sector faces serious problems of a turbulent market environment, which poses new challenges and approaches to them in ensuring the competitiveness of the organization of the cooperative system. The purpose of the research is to identify the role of consumer cooperation at the current stage of the development of a market economy and the impact of digitalization of economies on the efficiency and effectiveness of their activities. The methodological basis of the study was the fundamental works of Beche B., Grigoriev L., Keshelava A., Budanov, V., Rumyantsev, V., Marie J., Carini C., Eum H., Madeg Le Guernic, Rousselière D. and others. The decline in global business and production activity in the context of the global pandemics of 2020 has intensified the service sector of the non-productive sector and domestic services, as well as the use of information and communication technologies for the interaction of market economy participants. The comparative experience of digitalization of the world's economies, the results of the application of information and communication technologies in practical activities by large infrastructure economic entities demonstrate the effectiveness of integrated models of the digital and offline environment. Digitalization of the system of consumer cooperation is an important component of the socio-economic, cultural development of members, customers and producers of cooperatives, as well as a guideline for ensuring the competitiveness of the state and society as a whole.

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Keywords Cooperative · Consumer cooperation · Digitalization · Digital economy · Ecosystem

JEL Code O1

1 Introduction

The system of consumer cooperation has passed a long period of its formation and development. In foreign countries of the eighteenth and nineteenth centuries, the role and goals of cooperation did not differ significantly from each other. In the countries of Central and Eastern Europe (Beche 2011) there was a model of economic support for the members of the cooperative, in the countries of Western and Southern Europe the model of social economy of the cooperative sector was developed. Russia accepted the experience of foreign countries, and the development of the system of cooperation focused on the socio-economic and cultural directions of the state system.

At the same time, in the context of digitalization of the economies of the world, the cooperative sector faces serious problems of a turbulent market environment, which poses new challenges and approaches to them in ensuring the competitiveness of the organization of the cooperative system, which reflects the relevance of the topic of research. This forms the goal of the scientific article, which consists in studying the digitalization of the corporate sector of the economy in a competitive market environment.

The presented goal of the research reflects a number of tasks: revealing the role and importance of organizing consumer cooperation at the current stage of the development of society in general and the corporate sector in particular; Consideration of comparative experiences in digitalization of economies and the corporate sector, with a view to summarizing the results; development of a recommendation to improve the activity of consumer cooperation in a competitive market environment in conditions of digitalization of economies.

2 Methodology

The synthesis of the theoretical material of foreign and domestic authors made it possible to form a modern idea of the activities of cooperatives and the organization of a system of consumer cooperation.

The use of the historical analysis method made it possible to reveal the role and importance of the organization of consumer cooperation at the modern stage of the development of society.

During the study, we relied on official data from the World Trade Organization, the International Cooperative Alliance, the World Cooperative Monitoring and the rating sector, the Central Union of Russia and other public information.

Abstract-logical judgments, methods of analysis and synthesis and provided an opportunity to form general conclusions and recommendations for improving the activities of consumer cooperation.

During the study, universal methods of cognition were used: comparison, induction and deduction.

3 Results

The definitions given by the United Nations, the International Labour Organization and the World Organization of Consumer Cooperatives refer to a cooperative as an autonomous, autonomous and voluntary association of citizens, the purpose of which is to satisfy the socio-economic and cultural needs of members of the association and society as a whole.

The role of the cooperative sector in the world economy is significant. In 2019, the number of cooperatives in the world amounted to 2.975 million, and the share of the occupied population of the Earth is more than 12%, with a turnover of 300 leading cooperatives of more than 2.1 trillion dollars (Official Website of the International cooperative Alliance 2019), which exceeds Russia's GDP in 2019 equal to a little more than 1.62 trillion dollars (Ifinity 2020).

The world practice has developed a variety of cooperative types: corporate banks, loan and savings banks, consumer cooperatives, production cooperatives (production cooperatives, production services cooperatives), service cooperatives, marketing cooperatives, cooperative farmers' societies and agricultural cooperatives, housing cooperatives, housing and construction cooperatives, credit cooperatives (Kartashov et al. 2020).

Consumer cooperation in the cooperative sector occupies 6 part of all cooperatives in the world economy with an annual turnover of more than $ 560 billion at the beginning of 2020 year (World Cooperative Monitor 2019).

In accordance with the scheme presented by the members of consumer cooperatives, it should be noted that the members of the cooperative act as contributors, consumers, producers and consumers (clients) (Fig. 1).

Consumer cooperatives, like many other economic entities, operate in a turbulent market environment, as a result, the minimization and neutralization of internal threats and risks depends on the effectiveness of elements of the organizational structure of the cooperative, external negative factors are largely determined by preventive forecasting and planning methods. Cooperatives in the market environment compete with many business entities, including large systemically important organizations, and this determines from them the protection and promotion of cooperative philosophy.

It should be noted that many cooperatives in foreign countries seek to transform into joint-stock companies (public joint-stock companies), in particular, construction companies of Great Britain over time formed banking institutions, which naturally contradicts the cooperative philosophy (it is the optimal result for their members, and

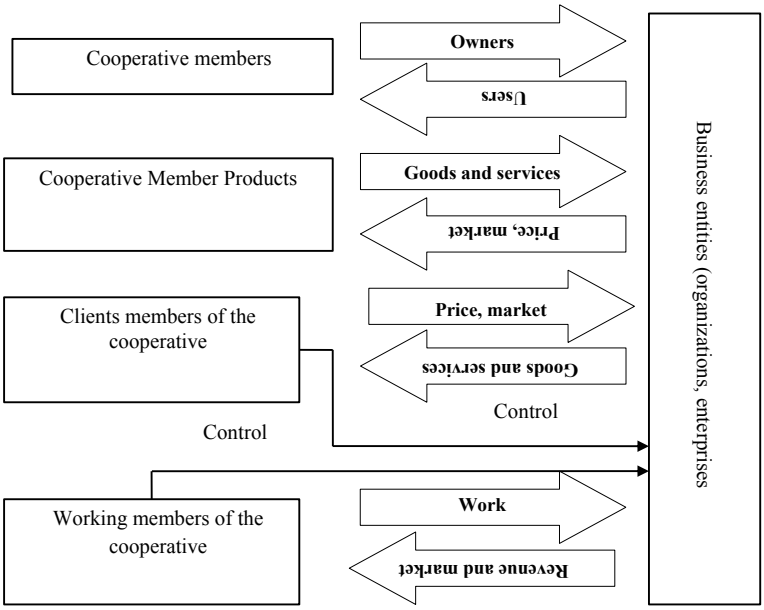

Fig. 1 Scheme of interaction of members of consumer cooperatives in the market environment. *Source* Summarized by the authors on the basis of Marie et al. (2020, pp. 8–10)

not maximizing the profits of the owners of the business entity (PPK "New Cooperation Technologies" 2020), as well as the temporary framework for the functioning of cooperative networks. The system of cooperation exists for a long period of time in different government systems, and their goal is the long-term socio-economic and cultural effect of the development of society, as well as the optimal result of their activities. Commercial organizations focus mainly on the interests of the owners and the top management of the business entity, unlike cooperatives, which is one of the competitive advantages of the cooperative sector. It should also be noted that the indicator of the activity of commercial organizations is financial and economic indicators (PPK "New Cooperation Technologies" 2020), (as a rule, in the reporting period), the organizations of the cooperation system have consumer satisfaction, members of the cooperation and the expansion of procurement, production and marketing activities with an orientation on socio-economic and cultural effects for society in the long term.

Table 1 shows the place of consumer cooperatives and the percentage of the industry and corporate sector (World Cooperative Monitor 2019).

Consumer cooperation is not only an important component of the cooperative sector, but also the main intermediary in procurement and marketing activities.

Table 2 presents the global dynamics of exports and imports of goods in 2013–2020 in billion dollars (World Trade Statistical Review 2020).

Table 1 Place of consumer cooperatives and percentage of industry and industry in the corporate sector at the beginning of 2018

Industry and scope of consumer cooperatives	Percentage of industry and national economy	Place of consumer cooperatives
Agriculture and the food industry	31.7	95
Education, health and social work	1	3
Financial service	7	21
Fishing	0.7	2
Housing	0.3	1
Industry	1	3
Insurance	38	117
Utilities	1.7	5
Wholesale and Retail	17.7	53
Other services	0.9	–

Table 2 World dynamics of exports and imports of goods (billion dollars) USA), 2008—1H 2020 (in two annual, annual and semi-annual sections) (Leonid et al. 2020; World Trade Statistical Review 2020)

Indicator	2008	2010	2012	2014	2016	2018	2019	1H of 2020
Imports, (billion dollars USA)	18,143	18,003	17,903	18,890	16,340	19,740	19,150	8250
Export, (billion dollars USA)	17,987	17,807	17,693	18,790	15,820	19,100	18,855	8040

Source World Cooperative Monitor (2019)

The global financial crises of the last two centuries, including the economic crisis of 2007–2008, objectively determined the stabilizing effect of the cooperative sector (Beche 2011) based on their strategic policies, mission, goals of functioning and development. However, the current market competitive environment and the decline in global business and production activity in the context of the 2020 global pandemics have intensified:

- Firstly, the services of the non-production sector and domestic services;
- Secondly, information and communication technologies of interaction between market economy participants, as well as the reorientation of consumers from the real world to the "hybrid world" and in particular to the virtual environment of society (Keshelav et al. 2017).

Figure 2 presents the approaches of the leading countries in the digitalization process.

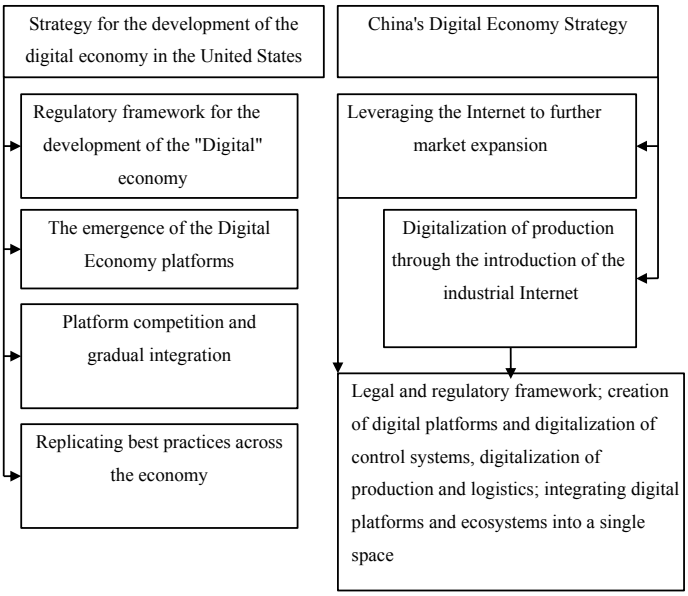

Fig. 2 Approaches of the leading countries of the "digitalization" process. *Source* Keshelav et al. (2017)

These approaches involve changes in business processes and the structure of management of business structures consisting of components of intermediary structures, the formation of digitalization of entrepreneurial structures, the creation and integration of ecosystems and digital platforms in the "hybrid world."

Therefore, the cooperative sector in general and consumer cooperatives in particular need to further invest in the common values of society (Gorlachev et al. 2020), take into account the preferences of consumers of the products of cooperatives in relation to the interests of their members, but not prevail over them.

This also poses challenges for consumer cooperation to effectively use information and communication technologies and image infrastructure interaction between cooperatives and society.

One of the main directions of improving the cooperative movement in the last decade is the creation of brands of the manufacturer, regional and umbrella brands with the "KOOP" brand (Official Website of the Central Union of the Russian Federation 2020b).

It should be noted that for each brand of cooperation, each member of the cooperative is responsible for the quality and timing of fulfillment of its obligations. This requires the formation and development of a standardization center and a quality control system, as well as the creation of a register of regional brands (Official Website of the Central Union of the Russian Federation 2020a). This will make it possible to form a collective marketing system in the sale of products of the cooperative sector, as a result of the integration of manufacturers with identical directions

contributes to the clustering of the organization of consumer cooperation (Official Website of the Central Union of the Russian Federation 2020b).

The transition of trade to the Internet, the development of information and communication technologies in public development determine the use by consumer cooperation organizations of new methods and methods of interaction with consumers in the conditions of digitalization of the economies of the countries of the world.

In the system of Russian consumer cooperation, digital capabilities are as follows: a service for creating a single electronic identifier "Coop ID" (digital registry, customer identification); "Coop Pay" payment system (QR-code payment); electronic trade price tags (Official Website of the Central Union of the Russian Federation 2020b).

We believe that the following models should be used for the system of consumer cooperation in the conditions of digitalization: a cooperative uniting workers (IT specialists); a cooperative that brings together consumers of IT services; cooperative that unites IT organizations; a cooperative that brings together employees (IT professionals) and customers of IT services; a cooperative that brings together workers (IT specialists) and IT organizations; a cooperative that brings together consumer and worker cooperatives; cooperative unit in cooperation of other employees (IT specialists) (Honcharenko et al. 2019).

The experience of foreign countries and infrastructure and system-forming organizations in the system of digitalization of economies, namely Google, FaceBook, Amazon, Intel, Tencent, Alibaba Group, as well as domestic business entities such as Sber, determines the development of integrated ecosystems for consumers and manufacturers on platforms and services created by organizations. This experience can be adapted and integrated into the consumer cooperative system, with cooperatives supporting affiliates, usually small and medium-sized enterprises, by providing them with procurement and trade services, the quality of which can only be guaranteed by franchising-based cooperation, under a single brand, which increases their competitiveness (Beche 2011).

The use of information and communication technology systems by consumer cooperation in their procurement, production and marketing activities will increase the socio-economic and cultural effect in society, the formation of a single brand contributes to improving their quality and competitiveness in the market environment.

4 Conclusion

The comparative experience of digitalization of the world's economies, the results of the application of information and communication technologies in practical activities by large infrastructure economic entities demonstrate the effectiveness of integrated models of the digital and offline environment.

Digitalization of the system of consumer cooperation is an important component of the socio-economic, cultural development of members, customers and producers

of cooperatives, as well as a guideline for ensuring the competitiveness of the state and society as a whole.

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Digital Transformation of Consumer Societies: Opportunities and Perspectives

Alexander A. Stepanov, Mikhail V. Rybin, Margarita V. Savina, Ilya A. Stepanov, and Nadezhda V. Morozova

Abstract The purpose of the research is to determine the main directions and trends of digitalization and digital transformation of the activities of consumer societies. Research methodology—system-creative analysis—a set of principles and methods for finding and substantiating innovative concepts and methods for solving non-standard problems in situations of increased uncertainty. The use of system-creative analysis makes it possible to search for adequate and effective methods, techniques and tools to substantiate fundamentally new models, including in managing the processes of digitalization and digital transformation of the consumer cooperation system. Results: Proposals are formulated to organize and manage the development of digital technology and digital technologies into the practice of modern domestic consumer societies and their unions. Features of application of system-creative approach to research of key issues of organization of process of digital transformation of consumer cooperation in conditions of transition to new information-digital technological method of production and consumption are disclosed. The need for a comprehensive solution of the three main issues of the process of digitalization and digital transformation in consumer societies and their unions is justified: the introduction of digital technology and technologies; developing new forms of organization and management, as well as improving the management of consumer societies and their unions in the new conditions.

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Keywords Consumer cooperation · Consumer societies · Digitalization · Digital transformation · Forms of organization · Management · Methods · Models

JEL Code O3

1 Introduction

Today, large corporations, holdings and companies capable of controlling entire industries and regions are becoming leaders in digitalization of socio-economic processes. Small and medium-sized businesses often keep up with them. At the same time, a number of industries and spheres of the national economy, for various reasons, lag behind the mainstream digitalization.

Consumer cooperation of the Russian Federation at the stage of transition to an information and digital society remains one of the key elements in the system of a dynamically developing multi-layered economy of the Russian Federation. At the same time, as many studies have shown, one of the key problems of the development of consumer cooperation is its digitalization and digital transformation (Bitkina et al. 2020).

2 Methodology

As a generalization of domestic and foreign experience shows, the use of traditional methods and concepts in solving the problem of creating effective systems for managing digitalization and digital transformation processes does not make it possible to find acceptable effective solutions.

In the context of the digital transformation of the modern technological method of production and consumption, the tools used in management science and practice, based on the imperatives of the known methodological postulates, are no longer effective. Scientific research and practice show that today the most effective management decisions are based to a large extent on improvisation and an intuitive understanding of the situation (Stepanov et al. 2020)

The theoretical and methodological basis of the research was system-creative analysis. It is system-creative analysis that is a tool for knowing new features and specifics of the formation of effective systems for managing digitalization and digital transformation processes in an innovative economy (Stepanov et al. 2018)

System-creative analysis is a system of values, norms, principles and methods for solving intractable problems and problems. System-creative analysis, as shown by world practice, is an adequate tool when creating new, original, highly efficient control systems.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers

as Gubin et al. (2013), Kurlaev (2019), Kurochkina et al. (2011), Tkach (2017), Antonova et al. (2017), Stepanov et al. (2017, 2020), and Veselovsky et al. (2018).

The authors also used the materials from Smart harvesters and geological drones: how digitalization is changing the economy, science 4.0[1] in this study.

3 Results

According to the company PricewaterhouseCoopers (PwC), in 2018, the leader in the development of digitalization and, in particular, electronic commerce was the People's Republic of China (PRC), where Internet sales exceeded 23% of the global retail market. It is followed by the United States with ten percent. Russia share in this market was only 4%.[2]

The development and implementation of innovative concepts and plans for the development of consumer societies based on the restructuring of business processes using digital technology and technologies, the digital transformation of management models by business processes is a strategic direction for improving their activities.

At the same time, the processes of digitalization in consumer cooperation of the Russian Federation are ambiguous. The main reasons here are the low level of computerization, information security, the use of modern methods of Internet and electronic commerce, etc. (2014)

Today, the use of artificial intelligence in consumer cooperation (trade in goods) makes it possible to monitor the situation in real time and develop a forecast of behavioral strategies for the future.

The use of artificial intelligence in the activities of consumer societies, among other things, makes it possible for manufacturers to more effectively work in the process of complying with environmental standards and respond to their deviations from environmental standards.

Digital twin technology is also widely used in consumer societies and their alliances. The application of this technology enables efficient visualization and exchange of all available digital information.

The digital double allows you to integrate information from a wide variety of sources, including from used information, analytical models, 3D visualization models, etc. It is the digital twin that is the ideal tool for creating and managing business processes, since it allows you to:

- Firstly, organizing joint work in forecasting, planning and implementing the activities of consumer societies;

[1] Smart harvesters and geological drones: how digitalization is changing the economy, science 4.0. URL: https://trends.rbc.ru/trends/industry/cmrm/5efb5b0a9a79473caae9518chttps://trends.rbc.ru/trends/industry/cmrm/5efb5b0a9a79473caae9518c (Data accessed: 05.11.2020).

[2] Smart harvesters and geologist drones: how digitalization is changing the economy. Read more on RBC.

- Secondly, it allows you to exchange the necessary data and information in real time on the state of all business processes of consumer societies;
- Thirdly, it allows you to control over the exchange of information, its updating among interested persons.

The use of digital twin platforms enables the rapid exchange and analysis of various documentation and operational data, as well as improves the efficiency and quality of consumer management processes.

Today, the Central Union proposes to use the electronic identifier service, with the help of which the customer data is translated into a digital register and identified. Payment systems are being implemented based on digital payment technologies for calculating the QR code, etc.

The introduction of modern digital technology in all areas of activity of consumer societies creates not only objective prerequisites for the development of qualitatively new progressive technologies into business processes, but also provides a digital transformation of the processes of organizing and managing consumer societies and their unions.

Digital transformation is a process of transition to new, more advanced forms and models of organizing and managing the activities of consumer societies.

The introduction of digital technologies and the digital transformation of the activities of consumer societies provide their main competitive advantages at a qualitatively new level (targeted appeal to the buyer; the possibility of using social networks to determine the most relevant goods in real time, etc.).

With the help of artificial intelligence, the problem of rational distribution of goods on shelves in stores is successfully solved. The introduction of online cash desks in the activities of consumer societies and their unions provides high-quality customer service. Modern digital technologies allow the introduction of electronic price tags, which are mini computers instead of paper price tags.

The use of digital technologies and the Internet fundamentally change traditional approaches to the organization and management of consumer society. Their use allows you to remotely manage the activities of cooperatives using cloud services; Carry out unloading and loading operations 24 h a day; carry out targeted sales, delivery and sale of goods every minute, as well as transfer online information about purchases to tax authorities.

Digitalization of consumer societies fundamentally changes the place and role of workers in technological and business processes, as well as the behavior of consumers, the model of their interaction and relationship with consumer societies.

The introduction of digital technologies and technology significantly affects the transformation of qualitative changes in the managerial and organizational mechanisms of consumer societies. Their implementation provides the possibility of making effective management decisions using information and digital technologies and technology in real time.

The creation of a modern concept of organizing the activities of trading enterprises of consumer society should be based on the principles of a network model and the

widespread use of modern digital technology, technologies, computers, the development of automation and the integrated mechanization of all business processes. At the same time, the main direction should be the introduction of modern information and digital technologies.

The wide introduction of digital technology and technologies will significantly affect the development of new most effective forms of organizing interaction of consumer cooperation with other representatives of business structures, interaction of consumer societies with consumers by creating new Internet communities based on developed platforms of collective blogs, forums, Web conferences, social networks, etc.

The introduction of innovative Internet communications can ensure an effective digital transformation of consumer societies, form the necessary prerequisites for the creation and functioning of new Internet communities at a higher information and technological level.

Fundamentally new forms of interaction between entities of consumer societies include outsourcing and crowdsourcing.

Outsourcing in consumer cooperation is based on the transfer by the consumer society of certain functions, business processes or activities to other organizations, enterprises, companies or physical persons.

The use of outsourcing as an effective form of interaction and cooperation in the activities of consumer societies has great opportunities. In particular, to solve such issues as the purchase of services for the organization of certain business processes (financial and information services, logistics, etc.); Production, either partially or completely outside consumer societies, to regions and enterprises with cheap labour; internal problems of consumer societies (for example, staff training, personnel support, etc.) based on the capabilities of specialized organizations, etc.

The advantages of outsourcing in consumer cooperation lie in the possibility of introducing certain types and functions of activity outside the cooperative formations, in particular, attracting highly qualified specialists and managers to carry out management functions, staff development, mastering advanced technologies, etc.

The use of outsourcing in the activities of cooperative organizations based on the use of digital technology and technologies provides high flexibility and rapid adaptation of the activities of consumer societies in the context of a constant change in consumer demand.

Another effective form of interaction between actors in consumer cooperation is crowdsourcing. The use of crowdsourcing based on digital platforms allows, on the one hand, to implement the key principles of the cooperative movement (voluntary participation of physical and legal persons), on the other hand, to significantly increase the efficiency of their activities through the use of high-performance digital technology and technologies.

4 Conclusion

Digitalization of the activities of consumer societies, digital transformation ensures the systemic interaction of them with all elements of the real sector of the modern economy. These processes contribute to their effective innovative development at all stages of activity.

The process of digitalization and digital transformation should not be seen as a universal, magical tool that can ensure the long-term sustainability and effective development of consumer societies. In addition to the saturation of consumer societies with digital technology and technology, it is necessary to constantly improve organizational and management processes and develop a digital culture within consumer societies.

Digitalization of consumer societies is an integrated process, which should be based on a new concept of the model of organization and management of their activities.

The formation of an effective model for managing the digital transformation of the activities of consumer societies should be aimed at developing innovative schemes for the effective interaction of cooperative actors.

Therefore, the choice of methods for managing the digital transformation of consumer societies acts as a key methodological issue. Such methods must meet the requirements of simplicity, reliability, adaptability, speed, optimality, and economy.

The formation of effective models for managing digital transformation processes in consumer societies requires the use of specific methods that are adequate for creative processes.

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The Role of Virtual Outsourcing in Ensuring the Effectiveness of Economic Development

Galina A. Markeeva

Abstract The effectiveness of the development of modern business entities of various scales and profiles in a dynamically developing digital economy largely depends on the quality of the use of virtual outsourcing opportunities. The purpose of the article is to clarify and develop the theoretical provisions in the field of virtual outsourcing, the features of its use by organizations to improve the financial and economic efficiency of functioning. The article proposes the author's classification of types of virtual outsourcing, which will allow organizations to determine the most preferred option of outsourcing activities, depending on the goals of integration into the digital economy and the available resources. It is proved that virtual outsourcing in the global economy in 2010 did not have a significant positive impact on ensuring the profitability of companies' products. The main institutional features of virtual outsourcing are highlighted. The article is used such basic methods as economic and theoretical analysis of the essence and advantages of virtual outsourcing, analysis of time series, structural economic analysis, correlation and regression analysis, methodological tools of institutional economic analysis.

Keywords Outsourcing · Virtual outsourcing · Digital economy · Business · Processes · Institute · Virtual economic interactions

JEL Codes O32

1 Introduction

One of the most dynamically developing sectors of the modern digital economy is the sphere of virtual outsourcing. In the most General form, virtual outsourcing is a paid delegation of a number of business processes for the development of a business entity (outsourcing) to some specialized structure or the intensity of the development

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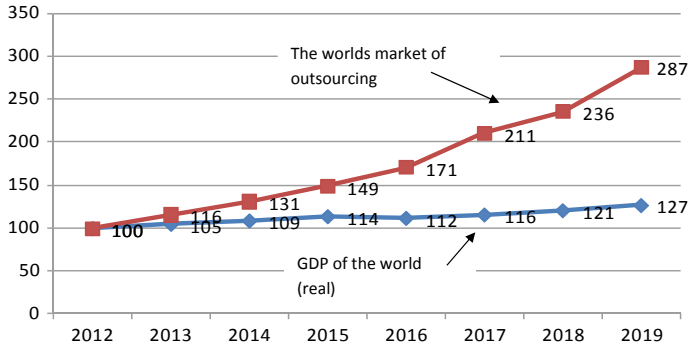

Fig. 1 Comparative dynamics of the rate of change of the virtual outsourcing market in the world economy and world GDP, % by 2012 (Craig 2020)

of virtual outsourcing relations can be evidenced by the comparative dynamics of the pace of its change in the world economy (Fig. 1).

As shown in Fig. 1, in 2012–2019, the growth rate of the global virtual outsourcing market capacity was 287.0%, which significantly exceeded the overall rate of change in global GDP, which was only 127.4% in nominal terms. In General, this indicates the predominant focus on using the economic potential of virtual outsourcing by business entities of various States of the world economy and branches of the national economic complex.

The first studies devoted to the content of virtual outsourcing appeared in 1990 (Quinn and Hilmer 1994; Wilcox et al. 1995). In 2010, the range of studies on the nature and features of virtual outsourcing was quite extensive: some authors considered the impact of this type of outsourcing on improving the efficiency of startups implemented in virtual markets (Dibb 2017; Ris 2017). Some Russian researchers have considered the impact of virtual outsourcing on ensuring the effectiveness of the development of industrial enterprises of the Russian Federation (Ismagilova et al. 2014) and territorial economic clusters (Safiullin et al. 2013).

The purpose of the article is to clarify and develop the theoretical provisions in the field of virtual outsourcing, the features of its use by organizations to improve the financial and economic efficiency of functioning. The main objectives of the article are:

- develop a classification of types of virtual outsourcing;
- to assess the impact of the intensity of the development of virtual outsourcing on the average level of profitability of the global industry in 2012–2019;
- to systematize the directions of influence of the main financial and economic institutions on ensuring the effectiveness of the use of virtual outsourcing.

2 Methodology

The literature presents different approaches to assessing the impact of virtual outsourcing on efficiency of development, and in particular the sociological approach (Pitelis and Teece 2009), expertise (Zenger et al. 2014), analysis of the impact of virtual outsourcing on the dynamics of transaction costs development organizations (Petrakis and Valsamis 2013). August considering especially the impact of virtual outsourcing to balance the activities of the companies (August et al. 2002). A. king evaluates the virtual outsourcing from the point of view of increase of efficiency of use of fixed capital of companies (King 2011).

This article uses such basic methods as economic and theoretical analysis of the essence and advantages of virtual outsourcing, analysis of time series, structural economic analysis, correlation and regression analysis, methodological tools of institutional economic analysis.

3 Results

In our opinion, the main advantages of virtual outsourcing for business entities (potential or actual outsourcing) in modern socio-economic conditions are:

- the possibility of delegating part of the business processes of the organization's development to professional structures;
- the possibility of reducing the level of specific operating and transaction costs for the development of business entities by transferring part of business processes to remote management and increasing the potential level of their financial and economic efficiency on this basis;
- the perspectives of further mutually beneficial economic interactions, based on relations of virtual outsourcing, for example, through models of virtual franchising, joint implementation of investment projects and start-UPS outsourcer and outsource, etc.

It should be noted that the issue of classification of virtual outsourcing types is not sufficiently systematically covered in the specialized literature. To fill this gap, we have developed a classification of types of this type of financial and economic interactions in the virtual space of the digital economy according to significant economic and managerial criteria (Table 1).

The structure of types of virtual outsourcing, considered in the context of objects of outsourcing activities, is shown in Fig. 2.

As shown in Fig. 2, in 2019, the dominant position in the structure of virtual outsourcing in the global economy as a whole was personnel outsourcing (37.1% of the volume of all outsourcing contracts). In 2020, due to the conditions of the pandemic crisis, first of all, the sanitary and epidemiological restrictions that directly follow from it and the official self-isolation regimes established in most countries

Table 1 Classification of types of virtual outsourcing (based on our own research)

Classification feature	Types of virtual outsourcing
1. Virtual outsourcing object	– production virtual outsourcing – logistics virtual outsourcing – HR virtual outsourcing and Finance, virtual outsourcing, etc.
2. The status of assets are outsourced	– virtual outsourcing of property objects outsourcing – virtual outsourcing of objects under lease outsourced and (with the knowledge of the landlord) – virtual outsourcing of objects that are used by the outsourcer on the basis of the rights of economic management or operational management
3. The nature of using the potential of the digital economy	– virtual outsourcing between subjects of the real sector of the economy, carried out through communications; – virtual outsourcing, in which the outsourcer refers to the real sector of the economy, and the outsourcer-to the virtual – virtual outsourcing, in which all its participants belong to the virtual sector of the economy
4. Features of the formation of the outsourcer's remuneration	– virtual outsourcing, in which there is a direct financial reward for the outsourcer – virtual outsourcing, in which the outsourcer has the right to prefer entail use of the services of the outsourcing object; – virtual outsourcing, in which the outsourcer receives a share in the capital of the project-object of outsourcing
5. The degree of validity of virtual outsourcing	– virtual outsourcing, the parameters of which are formed mainly on the basis of the intuition of the management corps – virtual outsourcing based on the use of the analytical potential of expert technologies; – virtual outsourcing, the parameters of ensuring the effectiveness of which are argued through a system of economic and mathematical methods and models
6. Integration of virtual outsourcing and online consulting	– virtual outsourcing, the initial scheme of which is formed with the participation of Internet consultants

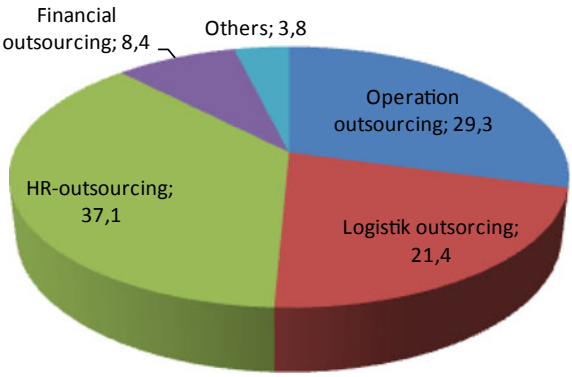

Fig. 2 Structure of types of virtual outsourcing in the context of objects of outsourcing activities in the world economy, 2019, % (Phillips and Sharman 2010)

of the world economy, the trend of the dominance of personnel outsourcing in the structure of virtual outsourcing is likely to have intensified.

The second most important type of virtual outsourcing in the global economy is production outsourcing. Its content is related to the remote location of workshops, branches, and other production units of companies of various profiles and, accordingly, the management of the latter on a virtual basis, usually based on the use of some special digital outsourcing management platforms. It is quite dynamic in 2012–2029 virtual logistics outsourcing has also developed, the content of which is the remote location of warehouses and other logistics facilities of the business entity and the subsequent optimization of logistics flow processes on a virtual basis.

As follows from the information given in Fig. 2, financial outsourcing occupies a relatively insignificant share in the structure of virtual outsourcing types in the global economy (8.4% at the end of 2019). At the same time, in 2012–2019, the share of this segment of outsourcing relations increased from 3.9% or 2.24 times, which is quite significant.

From the point of view of the correctness of the formation and implementation of outsourcing contracts, it is also essential to classify the types of virtual outsourcing depending on the legal status of the objects being outsourced. This classification is important for production, logistics, and partly financial virtual outsourcing.

Thus, the greatest degree of freedom in terms of the formation and implementation, as well as the subsequent possible change in outsourcing relations, has an outsourcer, to whom the object of outsourcing belongs on the basis of ownership. At the same time, virtual outsourcing is also possible in relation to property that a potential outsourcer uses on the basis of other property rights provided for by the civil law system—in particular, on the basis of lease, the right of economic management (for state and municipal enterprises) or the right of operational management of movable and immovable property (for a number of institutions). However, in the latter cases, the parameters of the virtual outsourcing contract must be approved by third legal entities—the actual owner of the property being outsourced.

It is also important to classify the types of virtual outsourcing from the point of view of the features of using the potential of the digital economy within the organization and implementation of outsourcing contracts. So, usually both outsourcers and outsourcers are some economic entities of the real sector of the economy, but geographically remote, and the potential of the digital economy is used to form a system of operational and effective communications, create and develop a special outsourcing digital platform, etc. the option of virtual outsourcing, in which the outsourcer is a subject of the Internet economy, for example, a virtual Corporation, an Internet Bank, etc., has developed quite intensively.

Overall, we have developed a classification of types of virtual outsourcing allows you to determine the most preferred option of outsourcing depending on the nature of the object of outsourcing, the nature of the property rights to it from outsource, goals and objectives of the latter, the development features a virtual outsourcing market and its integration with the market of professional online counselling, etc.

Under other equal conditions, the most preferable is a virtual outsourcing, the efficiency of which is justified on the basis of application of economic-mathematical methods and models, with minimal use of irrational subjective factor based on situational use of the potential of Internet consulting, comprehensively use the opportunities to improve implementation performance on the basis of modern technologies the virtual space of the digital economy.

It is quite difficult to directly quantify the effectiveness of the use of virtual outsourcing by industrial enterprises. For an enlarged assessment of this kind, we will use the tools of correlation and regression analysis. So, theoretically, the impact of the intensity of development of virtual outsourcing in the world economy should have a statistically stable and direct impact on the dynamics of profitability of the world industry.

At the same time, as shown in Fig. 3, the function of the influence of the intensity of the development of virtual outsourcing on the average level of profitability of the

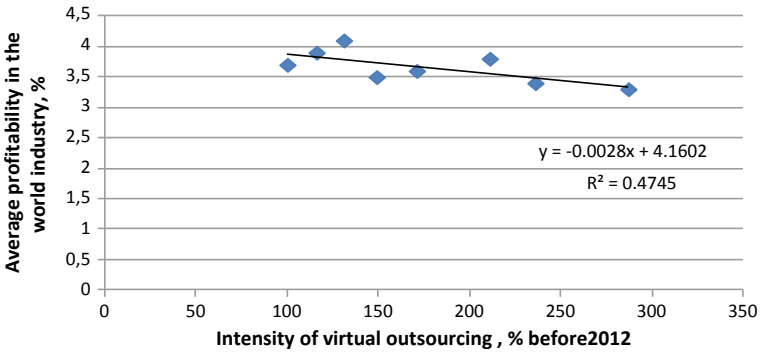

Fig. 3 Economic and statistical function of the impact of the intensity of development of virtual outsourcing on the average level of profitability of global industry, 2012–2019 (constructed by the author on the basis of information contained in World Annual Report (2020))

Table 2 The main institutions influencing the development of virtual outsourcing and ensuring its effectiveness (systematized by the author)

General economic institutions	Special institutes of the digital economy
1. Institute of property 2. Institute of arbitration court 3. The Institute of the arbitration court 4. Institute of corporate governance 5. Institute of state control 6. Institute of financial and economic education	1. Institute of state regulation of the digital economy 2. Institute of virtual economic calculations 3. Institute of remote employment 4. Institute of crypto asset exchanges and ICOS 5. Institute of social networks 6. Internet banking Institute 7. Institute of virtual crowd sourcing, etc.

global industry, built on the basis of data from 2012 to 2019, is statistically rather weak and anomalous, the reverse. This indicates the insufficient use of the potential of virtual outsourcing by the majority of modern enterprises of the world industry, the need to improve the mechanisms for applying virtual outsourcing models by enterprises of the real sector of the economy.

It is quite promising to consider the trends and problems of the development of digital virtual outsourcing in the coordinate system of the institutional economy. The Central element of the institutional paradigm of the study of economic processes and phenomena is the concept of an institution, which is a complex of interrelated formal and informal norms and rules that regulate certain aspects of the behavior of economic entities, as well as mechanisms of enforcement.

The development of relations within the framework of virtual outsourcing is influenced by a number of significant socio-economic institutions, the main of which are shown in Table 2.

Thus, as shown in the table above, the development of digital outsourcing relations and ensuring its effectiveness are influenced by both General economic institutions, such as the institutions of property, arbitration, and corporate governance, and special institutions that were formed in the modern digital economy in 2000–2010.

For example, the stability of the development of the property institution in the national economic and legal system directly affects the possibility of forming and implementing a long-term strategy of financial and economic development by business entities, including in terms of implementing investment projects in the field of virtual outsourcing of individual business processes and management functions. If the institution of ownership in the economy is not sufficiently developed, the rights of organizations and other groups of economic entities to the funds and results of operational, sales, and financial activities are not sufficiently protected, then the effectiveness of outsourcing relations in such conditions will also be potentially quite low.

It should be noted that the Institute of special financial and economic education in the field of virtual outsourcing of business processes within the General space

of higher education of the Russian Federation is not yet sufficiently developed. In particular, in the structure of the STATE ECONOMIC and managerial profile, certain aspects of both outsourcing relations in General and socio-economic interactions in the paradigm of virtual outsourcing are currently practically not reflected, which makes it difficult for universities to form appropriate educational courses.

In addition, as shown in the table on the development and maintenance of financial-economic efficiency of virtual outsourcing relationship is directly influenced by special institutions for the digital economy, which are actively formed and intensively modified in 2010–2020.

Institute of remote employment has a direct impact on the development of virtual outsourcing in the use of potential labour resources for the implementation of individual development areas or projects on a remote basis. The main elements of this kind of institution are:

- General norms of the national labor legislation, which must be fully implemented and subject to the involvement of personnel on the terms of virtual personnel outsourcing;
- provisions of employment contracts with employees of companies, projects or startups whose labor potential is used on the basis of virtual personnel outsourcing relationships;
- standards for the functioning of digital platforms used for remote employment project management;
- norms of associations and unions of employees whose labor opportunities are used within the framework of the system of relations of virtual personnel outsourcing (a promising element of the Institute of remote employment—in the economy of the Russian Federation, such trade unions in 2019–2020 are only at the stage of formation);
- decisions of courts of various levels on controversial issues related to the use of virtual personnel outsourcing relationships.

Institutions of virtual financial and economic settlements, Internet banking, as well as crypto asset exchanges and ICOS Provide financial support for virtual outsourcing relationships. In General, the stability and security of the functioning of individual organizational and economic mechanisms within these institutions directly depend on the completeness and timeliness of financial calculations for virtual outsourcing projects, and, as a result, the level of economic efficiency of the management process we are considering as a whole.

4 Conclusion

This article contains the following elements of scientific novelty:

1. The developed classification of types of virtual outsourcing, which allows to determine the most preferred option of outsourcing depending on the nature of

the object of outsourcing, the nature of the property rights to it from outsource, goals and objectives of the latter, the development features a virtual outsourcing market and its integration with the market of professional online counselling, etc.

2. the insufficient effectiveness of virtual outsourcing mechanisms in terms of the impact of the intensity of its development on the dynamics of profitability of the global industry is Proved.
3. the main directions of the influence of financial and economic institutions on the development of virtual outsourcing mechanisms are Systematized. At the same time, a comprehensive account of institutional factors in General and the intensity and direction of institutional changes in the area we study, in particular, will allow business entities to increase the level of efficiency in the formation and implementation of projects in the field of virtual outsourcing.

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Experimental Modeling of Smart City Development Process Based on Smart City Adaptive Concept Model

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Abstract Modern cities are now becoming intellectual entities in a state of competition for economic, financial, intellectual and human resources (Abosaq in Int J Adv Comput Sci Appl 10:177–185, 2019). Each of them seeks to build a behavioral model that allows you to withstand economic and technological competition most efficiently with optimal resource costs, take leadership positions on a national and possibly global scale, and become a "Smart City." According to experts of the consulting company McKinsey, by 2020 there will be about 600 Smart Cities in the world, in another five years they will generate almost two-thirds of world GDP (McKinsey Global Institute 2018). The growing role of progressive municipal economic systems in the development of the world economy is evident. Projects on the digitalization of urban economy and infrastructure in the concept of "Smart City" are actively implemented in many countries and regions of the world (Anthopoulos et al. in Int J Electron Govern Res 12(2):77–93, 2016), their focus is related to the automation and intellectualization of the functioning of the urban economy (Dvinsky et al. in J Siberian Federal Univ Human Social Sci 10(12):1869–1875, 2017), infrastructure facilities in order to increase the efficiency and productivity of the exploitation of urban assets, increase their life cycle, increase the level of economic activity, develop new markets and attract investment. The activity in this direction is mainly due to the new paradigm of urban development, which is aimed at sustainable socio-economic development, within the framework of which the city should be as intellectualized as possible (Hämäläinen in Contrib Manage Sci 63–86, 2020). The purpose of the research is to systematize methodological approaches to the use of the adaptive concept of "Smart City" in the implementation of projects for

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the development of municipalities in Russia. The research methodology is based on methods of theoretical generalization and systematization, which made it possible to structure provisions that reflect the modern vision of methodological approaches in the field of application of adaptive concepts and process models "Smart City." As a result, methodological approaches to the development of the adaptive concept of "Smart City" have been formed, allowing for the integrated and effective management of urban development based on the introduction of digital platforms, systems and services in their optimal and balanced combination.

Keywords Experimental modeling · Smart city development · Adaptive concept

JEL Codes C53 · P25

1 Introduction

Research practice has developed an understanding of Smart City as a conceptual area of integration of information and communication technologies and the Internet of things for urban asset management (Ivanenko et al. 2020; Nicel 2019). Experts give "smart city" characteristics such as active use of wide range of electronic and digital technologies, including for transformation of vital activities and infrastructure of urban environment, implementation of municipal administration, as well as implementation of practice of territorial localization within the framework of improvement of innovations and knowledge generated as a result of application of such concept (A New Era of Smart Cities 2020).

The simulation of the development process using the model of the adaptive concept "Smart City" in the present study was implemented experimentally and experimentally based on the generalization of the practice of the Novgorod, Nizhny Novgorod, Vladimir regions and the Republic of Dagestan. The Smart City adaptive concept model was used as the basis for the development of the Smart City conceptual development strategy, road maps of events, passports of regional projects and expertise in the implementation of integrated digital solutions and systems.

Traditionally, the prerequisites for the deployment of the concept of "Smart City" in the municipalities of Russia are the need to transform the inefficient system of urban management and maintenance of the urban economy (Koryakina et al. 2019), which inhibits municipal socio-economic development, and modern economic reality, the formation and dynamics of which is the result of the rapid development of scientific and technological progress.

Figure 1 systematizes the main reasons for the need to implement the Smart City concept in order to ensure high rates of socio-economic development of cities.

The target model of Smart City involves the creation of a system of effective urban management, based on the collection and analysis of key information and data on processes at the level of city administration, and focused on ensuring its sustainable

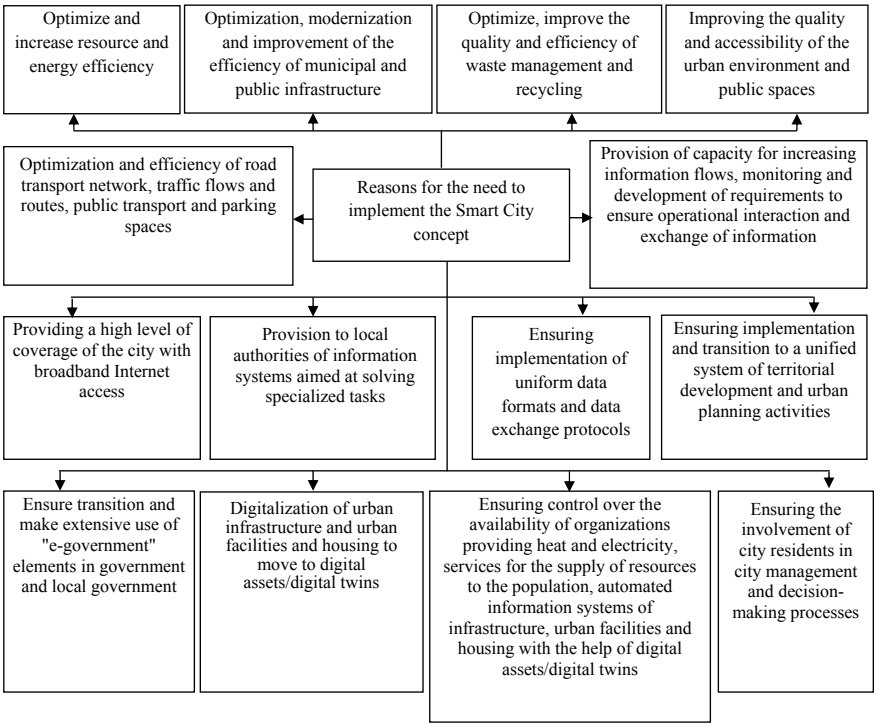

Fig. 1 Reasons for the need to implement the Smart City concept in order to ensure high rates of socio-economic development of cities

development, effective management of urban economy and resources, the development of the digital economy, growth of business activity and investment attractiveness, improving the quality of services and services provided, creating comfortable living and staying conditions.

Source compiled by the authors.

2 Methodology

The building of the target model is based on a centralized event management system based on the collection, processing, analysis of information and big data, operating on the basis of the Smart City digital platform, which provides:

- collection and provision of complete information and data on urban facilities for prompt management decisions and the creation of a register of digital assets of the city;

- collection and provision of information and data from sectoral facilities (heat, water, energy supply) affecting the activities of urban facilities and the city as a whole;
- collection and provision of social information and data on the quality of the functioning of urban and municipal services, the quality of service and the provision of services and services, and feedback on management decisions taken, programmes and activities implemented;
- analysis of continuously collected indicators of various processes for effective operational and strategic management.

A key component of the city management model is modern digital technologies for obtaining, processing and analyzing data to improve the quality and ensure the efficiency of decision-making by local governments.

This model of city management implies the creation of a single digital platform "Smart City" with an open API, allowing it to develop various services and services, allowing businesses to participate in this process by developing and connecting their modules, which will become the basis for a better collection of structured data and information for the purposes of city management and management decisions.

Decision-making based on big data analysis changes the principles of city management and contributes to improving the social, economic, environmental situation, improving the level and quality of life of the population. The more data and the more structured the collections, the more accurate the situation analysis and forecast models, the more accurate and high-quality solutions in the field of system planning for the development of the city.

The conceptual approach to the architecture of the Smart City platform (Fig. 2) is to implement an integrated intelligent city management system, which is based on engineering and technological infrastructure, including: data infrastructure, digital infrastructure, Internet of Things infrastructure, hardware and technical infrastructure and security infrastructure. Such a system with the help of intelligent data processing and predictive analytics, based on priority areas of development and existing business processes and algorithms, will be aimed at providing high-quality, accessible and personalized solutions and digital services for citizens and businesses.

In order to ensure unified coordination and control over the safety and reliability of the Smart City systems, a single technological operator is identified.

At all stages of the creation and implementation of the Smart City, planning and implementation activities are adapted to rapidly changing parameters, a constant dialogue is ensured, during which municipal projects are developed, execution is monitored and expectations are assessed.

Key performance indicators of the Concept implementation:

1. improving the quality of life and creating sustainable favorable conditions for living and staying people;
2. achieving effective city management through the use of new technologies and knowledge obtained as a result of intellectual processing of information about urban processes;
3. ensuring the business activity of small and medium-sized businesses;

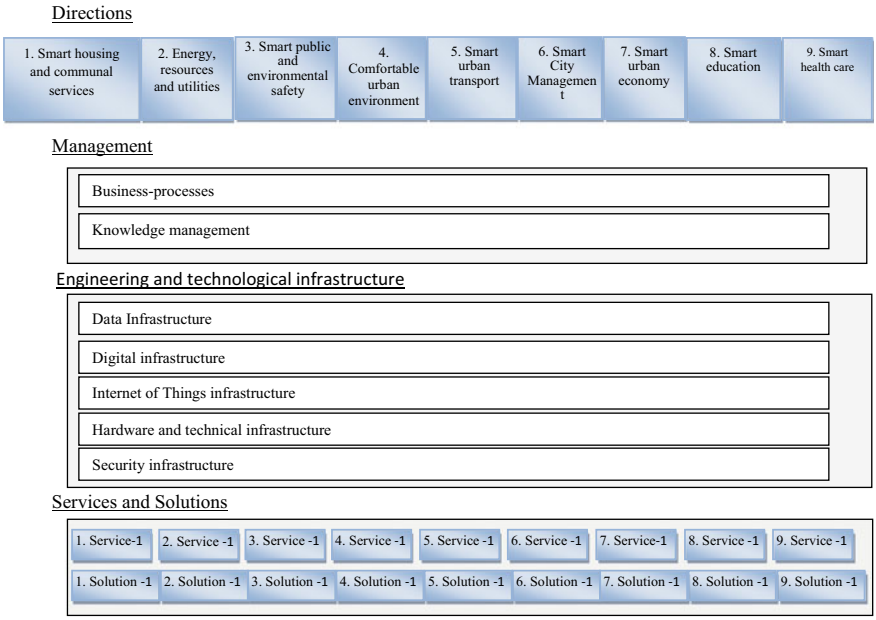

Fig. 2 Smart city architecture. *Source* Compiled by the authors

4. increase the competitiveness and attractiveness of the city for investment;
5. increasing opportunities for increasing social activity, strengthening a culture of transparency in decision-making in the field of municipal administration.

3 Results

Obviously, Smart City development projects are tools that make cities more comfortable for living and they are able to maintain interagency interaction, recognize the diversity of parameters and manage uncertainty. These factors are integral characteristics of urban dynamics and determine the attractiveness of cities.

The methodology for evaluating Smart Cities development projects should consider their impact on the city and assess their contribution to achieving city development targets. Each of the key elements should be an integral part of the projects and a basis taken as a starting point.

After determining the model of the adaptive concept of the "Smart City," a systemic view of activity in the development projects of the "Smart City" is formed.

In order to synchronize the model of the adaptive concept of Smart City and the global strategy for the development of the city with the implementation of specific projects to solve urban problems, a review of potential opportunities and their correlation with urban development goals and objectives is necessary.

Project initiatives identified within these criteria are reflected in Fig. 3.

Smart management	Participation	Smart environment	Networking and environmental monitoring
	Transparency and availability of information		Energy efficiency
	Public and social services		Urban planning
	Multilevel management		Smart construction and renovation
Smart Economy	Innovation		Resource Management
	Business		Environmental protection
	Local and global interconnectedness	Smart population	Digital education
	Performance		Creative activities
	Labour Market Flexibility		Working with ICT
Smart mobility	Traffic Control		Public construction and urban management
	Public transport		Inclusive society
	ICT Infrastructure	Smart Life Activity	Tourism
	Logistics		Health care
	Availability		Technology Availability
	Clean, motor-free options		Well-being and social integration
	Multimodality		Management of public spaces

Fig. 3 Project initiatives for the development of the Smart City direction. *Source* Compiled by the authors

Some of the project activities may be presented as a unique project, but others are more general and define basic scenarios for integration with multiple development projects.

A study of various possible project initiatives has shown (Novikov and Pronkin 2019) that different groups of projects can form specific sets of initiatives depending on certain goals and objectives for the development of Smart Cities. Grouping in different dimensions and forms a model of the adaptive concept of "Smart City" in the form of a combination of subtasks.

Using the above methodology and based on the model of the adaptive concept "Smart City," it is possible to develop complex digital solutions aimed at solving a wide range of problems in urban management and development.

4 Conclusion

The areas of improvement presented cover various areas of strategic regional management, which should be considered exclusively as integrated management solutions that contribute to improved governance at the regional level. However, the priorities of strategic management will be achieved with the appropriate development of the functionality of state regional management.

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University and Enterprise Cooperation—Effective Solution in the Digital Economy

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Abstract The article considers the improvement of the system of education and training of qualified personnel in the conditions of digitalization of society, which today covers all fields of life. As an effective solution to this problem, such a form of interaction as cooperation between a university and enterprises is being proposed. The active interaction of the enterprise and the university will significantly reduce the costs of training specialists, but at the same time significantly improve the quality, since it will be possible not only to take into account the needs of a particular enterprise, but also to conduct the training process on advanced, unique modern equipment. A positive example of such cooperation is the experience of cooperation between universities and enterprises in the design and implementation of an interdisciplinary export-oriented advanced educational program of higher education 05.03.01 Geology, profile "Oil and gas geology and geophysics" using a network form of the educational process. The project is implemented by three entities: the Federal State Budgetary Institution of Higher Education "Ufa State Oil Technical University" together with scientists and teachers of the Federal State Autonomous Educational Institution of Higher Education "Novosibirsk National Research State University," included in the TOP-200 of subject global ratings, and production partner—joint-stock company "Bashneftegeofisika", an advanced enterprise of the Russian oilfield service industry, which has more than 80 years of experience in prospecting for oil and gas in any geological and natural conditions using methods of seismic exploration and geophysical research of wells. As a result of the cooperation, the parties managed to create a unique program, according to which the training will make it

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possible to form a comprehensive specialist—a geologist-geophysicist, who professionally knows both the skills of processing and interpreting seismic data in the oil and gas industry, and the knowledge and competencies of a geologist-oil scientist.

Keywords Education · Production · Networking · Digital economy · Digitalization · University · Specialist · Geology · Geophysics · Professional competencies

JEL Codes H51 · H52 · H53 · H75

1 Introduction

Today, digitalization and digital transformation cover all sectors of society. This rapid implementation is associated with the ability to process large amounts of data, link them together, use them effectively, and ensure accessibility to a large number of users, thereby significantly increasing the efficiency of almost any processes.

One of the first in the digitalization process was business, gradually switching to models of business processes, management and production methods based on information technologies (Vichugova 2020). The dynamism of entering this process positively affects the competitiveness of companies both in Russia and abroad. Of course, all the above is true for educational processes, especially since in the field of education, by definition, people who are most susceptible to innovation and change should work. This naturally implies the need for advanced development and application of digitalization techniques and technologies in the educational process, as the first stage of immersion of future industry specialists in industry 4.0.

In this regard, the relevance of the problem of improving the education system and training qualified personnel for the digital economy is a key link in digitalization—and it is undeniable.

The fundamental foundations of the scientific issues studied in this article are laid in publication of Sadovnichy (2019).

2 Methodology

Experts at the Higher School of Economics Research University believe that the essence of digitalization in relation to the methodology of the education process is to effectively and flexibly use the latest digital technologies to transition to a personalized and result-oriented educational process. The rapid development of software products in recent years makes it possible to simultaneously ensure the selectivity, flexibility and individuality of training processes, orientation to the personal characteristics of the trainee, the formation of the portfolio of the future young specialist and the possibility of his support at a new workplace, the ability to ensure painless

social and production adaptation in the team. In relation to the Russian Federation, the authors of the report identify seven consecutive tasks of digitalization of training:

- Development of physical infrastructure;
- Introduction of digital programs;
- Development of online learning;
- Development of new training management systems;
- development of a system of universal identification of the pupil;
- Creation of school models;
- Improving the skills of digital educators (Galiev et al. 2020).

It is difficult to argue with the opinion of colleagues—the tasks are defined clearly and specifically, but their quick solution in the higher education system, in our opinion, is possible only if the university and enterprise cooperate. Why, in our opinion, is the issue of cooperation so important? We will try to consider the interaction of the university and the enterprise through the prism of relations between two economic entities of the market: the supplier and the consumer—where the consumer determines the quantity and quality of the delivered goods (in our case, a trained specialist). In this case, the quality of training of the future production professional can be considered in two aspects:

(1) training a universal specialist and then bringing him "up to condition" at the enterprise in the process of adaptation - a path that is very costly for the enterprise;
(2) training a specialist "made to order" with specific competencies for a specific production (Burdakova et al. 2017) is an even more costly, and often impossible, matter for the university.

The question of the quality of specialist training is not a private issue, but a challenge for the effective development of the enterprise and the country as a whole, and the common expression "consumer is always right" in this case clearly places emphasis on its places. In practice, we face a different situation: training at a university often boils down to the predominance of theoretical material over practical knowledge and skills in working on modern production equipment and in advanced working process management conditions. It is clear that in order to meet the educational process with modern economic conditions, significant investments are required, which, unfortunately, the Russian education system cannot provide at the moment—everything rests on the absence of funding sources. And even if we make a bold assumption about unlimited budgets for the formation of educational programs and the possibility of acquiring elements of modern production, will such costs really be justified only for organizing the educational process? It is here that the cooperation of universities and enterprises can play a key role.

Active interaction between the enterprise and the university allows you to significantly reduce costs. For example, the company has unique modern equipment, knowledge-intensive software complexes, which the university is simply not able to acquire today, as well as to prepare a qualified teaching staff, not only familiar with such equipment, but also capable of teaching the correct and effective use of

it. The solution of the issue is the use of the equipment of the enterprise, involving workers in the training process and conducting it in production. The "side effect" of such interaction—the student gets acquainted with production and the team, which significantly reduces adaptation in the future.

3 Results

As a concrete example of the practical use of these methods, we will consider the experience of interaction between universities and enterprises in the design and implementation of an interdisciplinary export-oriented educational program of higher education 05.03.01 Geology, profile "Oil and gas geology and geophysics" (hereinafter—the Program), using a network form of the educational process.

The project was initiated and financed by the Federal State Autonomous Educational Institution of Higher Education "St. Petersburg Polytechnic University of Peter the Great," aimed at the development and implementation of an advanced educational program of higher education with the involvement of staff from among leading scientists and teachers from universities, included in the top 200 substantive global ratings, and their partners from the real sector of the economy—specialists of oil companies and oil services enterprises—representatives of the oil and gas industry of Russia.

The purpose of the educational program is to train highly qualified engineers capable of independently carrying out professional activities in the field of geology and geophysics using the latest technological developments, methods and achievements in the field of geology and geophysical methods of mineral prospecting.

Training is based on the optimal combination of traditional and innovative educational technologies, a balanced combination of theoretical and practical components of the educational program, wide involvement of modern innovative approaches of geological and geophysical research in the oil and gas industry. The development of curricula involves the best theoretical scientists in the field of general and structural geology, geophysics, mineralogy, petrography and informatics. Many of the involved specialists have experience in practical work in geophysical production, in research centers of applied geology. Significant support is provided by specialists of various levels of geological, geophysical, hydrogeological and other specialized enterprises using the most advanced developments and technologies in the search and exploration of minerals by geophysical methods.

The implementation of the Program is carried out by three economic entities: the Federal State Budgetary Institution of Higher Education "Ufa State Oil Technical University" together with the scientific and teaching staff of the Federal State Autonomous Educational Institution of Higher Education "Novosibirsk National Research State University" and their production partner—the joint-stock company "Bashneftegeofisika," an advanced enterprise of the Russian oil service, founded in 1932 in connection with the discovery of the first oil field in Russia in the Ishimbay district of Bashkiria. The company is able to conduct exploration of oil and gas fields

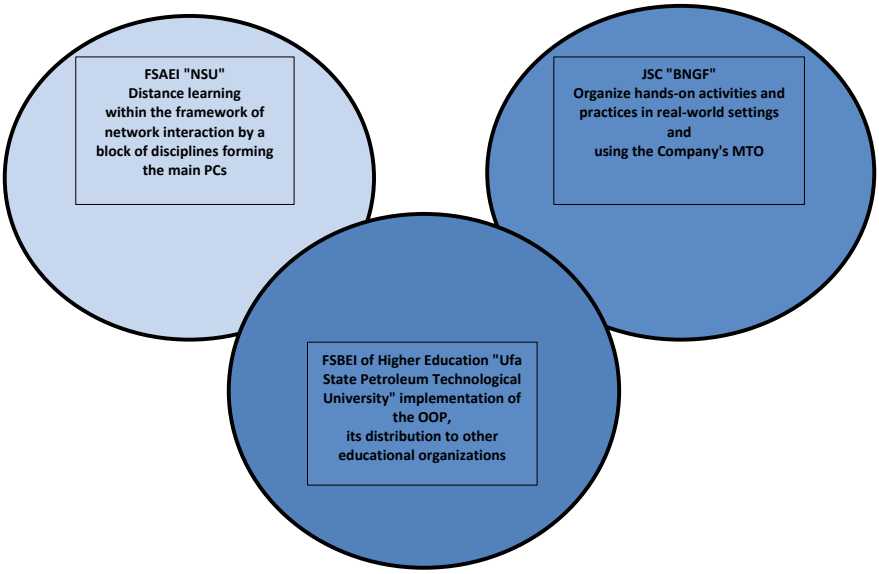

Fig. 1 Scheme of implementation of the program 05.03.01 Geology, profile "Oil and gas geology and geophysics". *Source* Compiled by the authors

in any geological and natural conditions by seismic exploration methods and accompany the processes of drilling and production of hydrocarbons with geophysical studies of wells. The implementation scheme of the Program is shown in Fig. 1.

A feature of the oil service industry, where one of the constituent elements includes geological and geophysical research, is that the latter lies at the junction of theoretical scientific developments and the need to solve pragmatic problems of reproducing the Russian mineral and raw material base, especially in the oil and gas sector: thus, the industry is directly related to the current demands of the mining industry—primarily in the person of vertically integrated oil companies, and many projects are carried out according to their direct order and orders of other subsoil users. Also, a significant share in geological and geophysical research, especially in seismic exploration, is the mandatory fulfillment of state requirements when acquiring licenses for the use of the bowels of the Russian Federation. Theoretical and practical knowledge quickly becomes obsolete, so it is important to implement continuous learning models. So, literally before our eyes in the field of oil and gas geology and geophysics, such new technologies have appeared as hydraulic fracturing, systems of continuous geophysical control and geonavigation during drilling (LWD-systems), inclined-directional and horizontal drilling of side boreholes of wells, methods of surface-polymer flooding to increase oil recovery and many others. To teach students this requires specialists, real simulators of production processes, an extensive material and technical base. Solving such a problem in practice is impossible without the actual interaction of the university and the enterprise. The availability of theoretical knowledge and practical skills allows you to reduce the time for adapting employees

at work: depending on the competence of the young specialist, mandatory adaptation usually takes from several months to several years. For example, the period of preparation of a good interpreter can last from three to five years—and this is a good indicator, even realizing that this period of "knocking" actually leads to the loss of profit of the enterprise. It is almost impossible to avoid this period, but it can be significantly reduced if the close connection of the educational institution with the enterprise allows you to prepare high-quality training programs adapted to specific needs and capable of giving the future specialist practical skills at the educational stage.

One of the main competencies of a modern engineer is the breadth of knowledge. A narrow specialist: a geologist, geophysicist, economist, developer, surveyor, driller—is replaced by universal specialists with a wide range of border knowledge: geophysicist-geologist-programmer, geologist-developer, geophysicist-driller-technologist, geologist-processor-interpreter, geophysicist-manager-economist and others.

The training of such workers requires the concentration of forces of many professional specialists (as practice shows, and the cooperation of several universities) and, of course, the use of a number of scientific methods, innovative approaches and advanced learning technologies, that is, the digital transformation of education.

Taking into account the above, the Program is developed on the basis of a competent approach using practical-oriented training, interdisciplinary, problem-oriented and project-oriented technologies (Grille 2020), and also involves the use of methods such as modeling, deduction, analogy and so on.

The basis for the formation of professional competencies is a block of interconnected disciplines for the processing and interpretation of seismic data: introduction to seismic exploration, processing of seismic signals, complex interpretation of seismic data, dynamic analysis in seismic exploration, introduction to geographic information systems and others. The scheme of development of the main educational program is shown in Fig. 2.

The educational program is based on the world's leading educational and scientific and technological trends and assumes that:

A significant part of the courses will be implemented in the form of intensities (Senashenko 2017), which will allow inviting specialists from other cities;
The group form of work will be actively used (Lukashenko 2011);
Training will be conducted using modern software packages and on real data (Safina et al. 2019);
The program includes an online course that will be placed on Russian educational platforms integrated with the state information system "Modern Digital Educational Environment" in the discipline "Seismic Signal Processing";
The program includes an online course in a foreign language "Seismic tomography: look inside the Earth," which will be posted on the international online educational platform Coursera;
There will be a discipline called "Python Programming" that contributes to the formation of competencies in the digital economy (Tcharo et al. 2020);

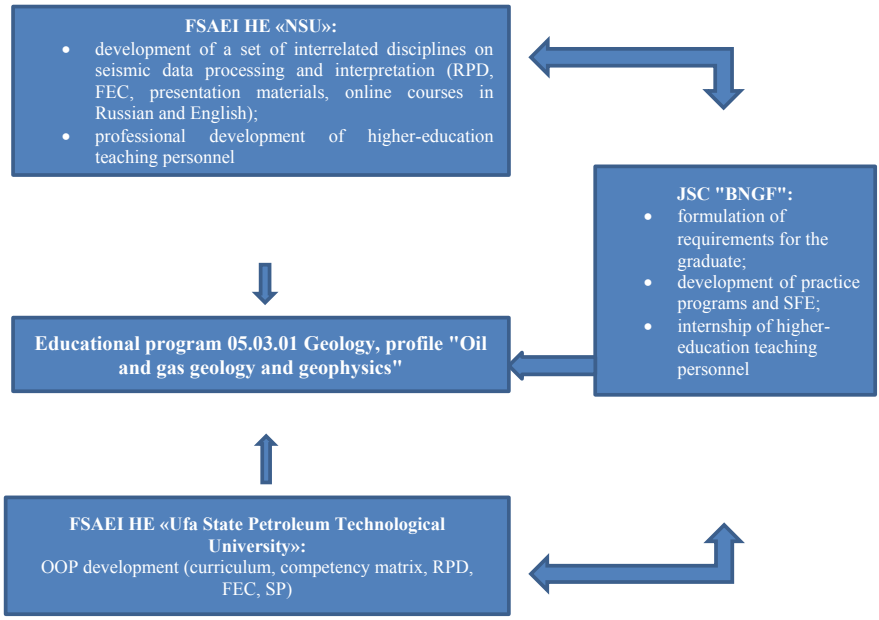

Fig. 2 Scheme of development of the main educational program 05.03.01 Geology, profile "Oil and gas geology and geophysics". *Source* Compiled by the authors

Mathematical training will be strengthened through additional chapters in the discipline "Mathematics," as well as professional—through additional chapters in the discipline "Seismic processing";
Based on modern technological requirements for geophysical surveys, the active use of geo-information systems for the design and planning of observation systems, the discipline "Introduction to geo-information systems" will be provided.

The request of the real sector of the economy is provided by participation in the preparation of the educational program of an industrial partner—the geophysical company "Bashneftegeofisika". The company has experienced personnel in the field of exploration geophysics, which provides:

Participation of employees of the basic enterprise in teaching[1];
Creation of examples and tasks based on real data;
Undergraduate training and apprenticeship on the basis of an industrial partner.

[1] Letter of the Ministry of Education and Science of the Russian Federation dated August 28, 2015 No. AK-2563/05 "On methodological recommendations". URL: https://garant.ru/products/ipo/prime/doc/71075428/ (Data accessed 14.09.2020).

4 Conclusion

Therefore, the developed educational program fully meets the requirements of the Federal State Educational Standard for Higher Education in the field of training 05.03.01 Geology and takes into account the basic needs of a potential modern employer, the main of which is the ability of a young specialist to work independently or, at least, minimizing the timing of adaptation of the latter at work.

The cooperation of the university and enterprises in the digital economy has proved to be an effective form of interaction, which made it possible to create a program, based on the results of the development of which a comprehensive specialist geophysicist-geophysicist will be formed—a generalist who professionally knows both the skills of processing and interpreting seismic data in the oil and gas industry, and the knowledge and competencies of a geologist-oil scientist.

The methodology described above allows us to open a new page in the interaction of the university and the enterprise—a personal and objectively controlled approach in the training of specialists for exploration and geophysical enterprises, primarily in the search for oil and gas fields.

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Creation and Debugging of a Digital Double-Cluster Cooperation Mechanism of Inter-Cluster Interaction Under Conditions of Stochastic Uncertainty

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Abstract Simulation modeling technologies based on the principles of stochastic optimization can bring a significant financial effect in planning investment development for industrial, innovation clusters, and federal districts of the country. In such circumstances, it becomes important to investigate the mechanisms of inter-cluster cooperation in the framework of a single district. Among the priority areas of this interaction, we include economic, financial, informational, and logistical cooperation. The creation and debugging of a digital double of such interaction would allow to solve important strategic tasks of the state without risky management decisions. The model for creating and debugging a digital double of inter-cluster interaction under conditions of stochastic uncertainty within a single federal district assumes as the main most significant characteristic of the success of such interaction is the natural population growth of the region in which this or that cluster is located. This model involves the implementation of such steps as the selection and adjustment of required parameters, building and debugging the statistical model, and stochastic algorithm optimization of the digital double. At the last stage, the corresponding settings of the pattern search method are used. An important result of our model of stochastic optimization of economic-financial, information and logistics inter-cluster interaction is that the increase in investment in fixed assets does not always lead to an increase in the population in the Federal District. This needs to be taken into account when reallocating investment and human resources within one federal district. The use of a digital double of the mechanism of inter-cluster interaction will allow avoiding premature unjustified management decisions of a state scale regarding the further

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development of innovative and industrial clusters located on the territory of a particular federal district of Russia. In addition, it will help to simulate the mechanism of inter-cluster interaction on a computer in the form of a corresponding digital double.

Keywords Stochastic optimization · A digital double · Inter-cluster interaction

JEL Codes C63 · E17 · O21 · O36

1 Introduction

In the context of managing large innovation systems, such as a region or an entire federal district, it becomes important to study the mechanisms of inter-cluster interaction within a single district (Yashin et al. 2019). Among the priority areas of this interaction, we include economic, financial, informational, and logistical cooperation. The creation and debugging of a digital double of such interaction would allow to solve important strategic tasks of the state without risky management decisions. Stochastic optimization of the identified digital doubles would make it possible to work out in advance the most optimal solutions concerning the evolution of large innovative systems, such as the federal districts of the country.

2 Materials and Method

We represent the stochastic optimization model of economic and financial, information and logistic inter-cluster cooperation in the framework of a single federal district (Fig. 1). To do this, let us go to the description of the stages of model implementation.

Stage 1—selection and adjustment of the required parameters of the digital double. The efficiency of inter-cluster interaction best reflects the natural population growth (y) in the analyzed regions, in which the corresponding innovation-industrial clusters are located. However, population growth must be dependent on such factors of the digital double model that would sufficiently reflect the directions of inter-cluster interaction, which include economic, financial, informational, and logistic types of interaction. Among such factors we include the average per capita income

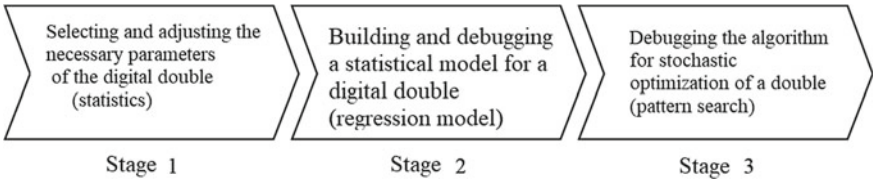

Fig. 1 Model of creation and debugging of the digital double of inter-cluster interaction in conditions of stochastic uncertainty. *Source* Developed and compiled by the authors

(per month) (x_1) investments in fixed assets (x_2) and exports minus imports (x_3). As a result, we will analyze the function of 3 variables $y = f(x_1, x_2, x_3)$ for planning the redistribution of the listed resources by the state in cooperation with business in order to increase the population of the federal district.

Stage 2—building and debugging the statistical model of the digital double. Here we use the model of multiple linear regression, and one that will be the most essential quality of the statistical parameters and at the same time does not contradict common sense (Damodaran 2002).

Step 3—debugging the algorithm of stochastic optimization of the digital double. The main idea of this algorithm is that the global largest value of the function of many variables on a given segment sought in the presence of stochastic uncertainty in the objective function. As an objective function is taken that regression, which is most justified from the perspective of econometrics and not contrary to the common sense of the analyst. However, it may be obtained by other regressive dependence, which will be no worse than the objective function from the position of the quality of the statistical model. They should be considered as noise elements for the objective function under study.

After that, the approximate value of this noise is determined, and the objective function is optimized globally, taking into account the noise. For this we use pattern matching algorithm (Pattern Search, Direct Search) (Conn et al. 1991,1997; Kolda et al. 2006). However, its standard settings may not allow finding the global largest value of the stochastic function. There is a danger of "getting stuck" at the local largest value in the process of simulation. On order to solve this problem we will use the advanced settings of pattern matching (Abramson et al. 2009; Audet and Dennis 2003,2006; Kolda et al. 2003).

3 Results

Let us consider the process of creating and debugging a digital double of the inter-cluster interaction mechanism using the example of the Volga Federal District (VFD). At the same time, we will consider in the Volga Federal District only those regions or republics in which innovation and industrial clusters are located.

Stage 1—selection and adjustment of the required parameters of the digital double. Using the indicators of the "Statistical Review" of the Federal State Statistics Service (www.gks.ru), we group the necessary data on natural population growth, average per capita income of the population (per month), investments in fixed assets and on exports minus imports for 10 years from 2009 to 2018. At the same time, for the purpose of data comparability. Indicators measured in rubles or dollars are adjusted for inflation.

Stage 2—building and debugging the statistical model of the digital double. With collected data for the 8 regions of the Volga Federal District, two of the most reliable models of multiple linear regression obtained in Statistica program:

Regression 1: $y = -290.198 + 0.036x_2 + 57.229\sqrt{x_1} - 33.052\sqrt{x_2}, R^2 = 0,6196;$
Regression 2: $y = 15,283 - 148,867,881\frac{1}{x_1} - 35\sqrt{x_2}$, $R^2 = 0.6201$.

In this case, the Statistica program itself dropped the variable x_3 as insignificant.

We construct two regression in Matlab program on the same graph (Fig. 2). It seems unnatural situation for regression 2 in the lower graph, where a maximum income of the highest population growth rate of the population will be at the origin of investments in fixed assets. Development of innovation and industrial clusters is impossible without investment in fixed assets. This can lead to a drop in production and a reduction in household incomes in this cluster. Then, as the objective function accepts regression 1 and 2, equation is shown in Fig. 3, which will be regarded as noise in the future.

Step 3—debugging the algorithm of stochastic optimization of the digital double. In order to estimate more qualitatively the approximate range of noise (Fig. 3), we subtract from the maximum value y of the noisy function, i.e., regression 2, the maximum value y of the objective function, i.e., regression 1. They can be found analytically by the graph in Fig. 3. So, for the regression 1:

Investment $x_2 = 0$ and the income of the population $x_{1,\max} = 37,914.6$ rubles.
then $y_{\max} = 853.2$ people.
Similarly for regression 2:
Investment $x_2 = 0$ and the income of the population $x_{1,\max} = 37,914.6$ rubles.
then $y_{\max} = 356.6$ people.
Then the noise makes the difference

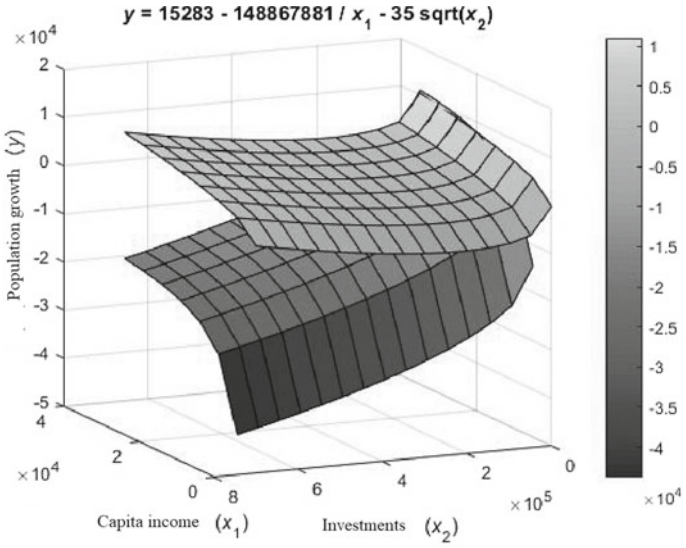

Fig. 2 Graphs two regressions 8 VFD regions with clusters. *Source* Developed and compiled by the authors

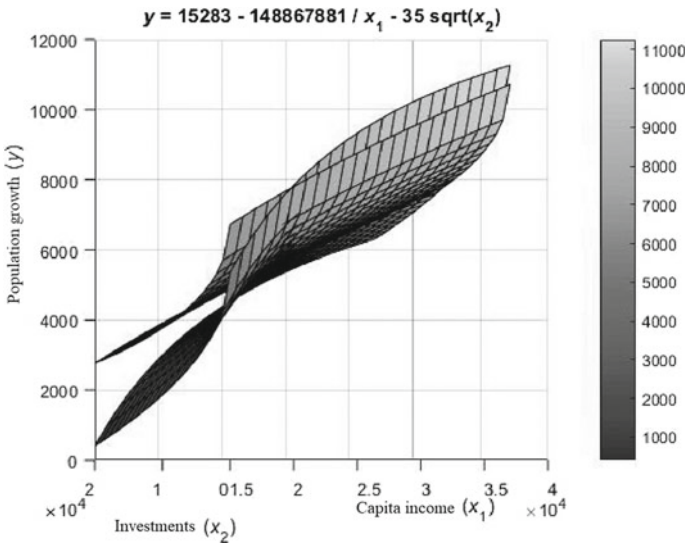

Fig. 3 Maximum values of two regressions graphs for 8 regions of PFD with clusters. *Source* Developed and compiled by the authors

$$\Delta y = 11{,}356.6 - 10{,}853.2 = 503.4 \text{ (ppl.)}$$

Thus, we have the problem of finding the maximum value of the stochastic function y on the given segments of its arguments:$x_1 \in [0; 37{,}914.6]$ and $x_2 \in [0; 736, 854.4]$.

The largest value of a smooth objective function, i.e., regression 1 without noise, can be found in Matlab using the direct interior point method (Babynin and Zhadan 2008). The result for the desired maximum population growth in one region is 10,853.2 people (Fig. 4). Since Matlab only solves the minimization problem, the graph of the objective function is reversed, and accordingly, the objective function taken with the opposite sign. The solution obtained by the direct interior point method, which is shown in Fig. 4 as "fmincon solution".

The largest value of the stochastic objective function, that is, regression 1 with noise, can be found in *Matlab* using both the direct internal point method (fmincon solution) and the pattern search (Pattern Search solution) (Fig. 5). Thus, the direct method gives the interior point optimization result $y = 31.7$ people, and pattern matching—$y = 381.8$ people, i.e. local, not global the greatest values of the function.

This problem can be solved by setting up the template search algorithm, i.e. using generalized templates (GPS) search and survey method, generating sets (GSS), and cellular adaptive search (MADS) (Abramson et al. 2009; Audet and Dennis 2003,2006; Kolda et al. 2003). As a result, we found that the greatest value of the objective function of stochastic population growth in one region there is a method to search for "GPS Positive basis 2 *N*" and the method of follow-up survey "GSS Positive basis 2 *N*". In this case, the maximum achievable population will increase by

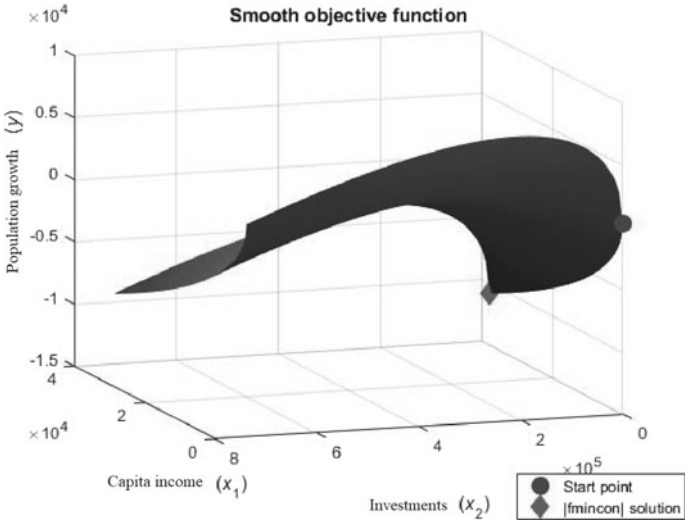

Fig. 4 Finding the smallest value of a smooth objective function. *Source* Developed and compiled by the authors

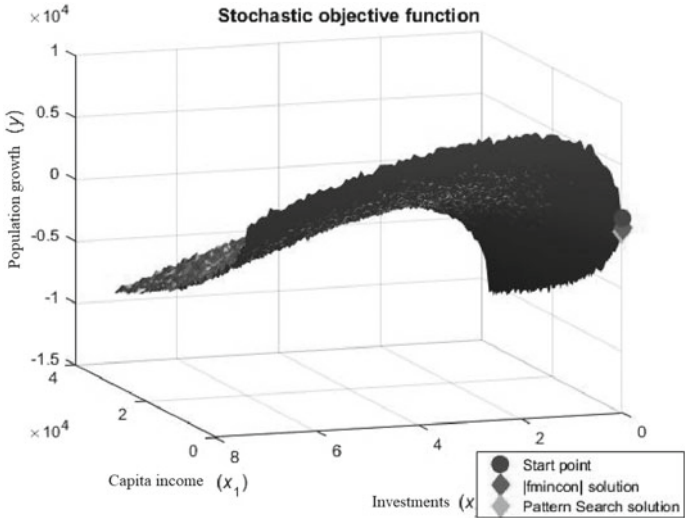

Fig. 5 Finding the smallest value of a stochastic target function. *Source* Developed and compiled by the authors

11,365 people. This is slightly more than what was obtained for the noisy function, i.e., regression 2. There were 11,356.6 people. This happened because of the noise itself. However, such maximum population growth in the region is possible with investments in fixed capital $x_2 = 0.5$ million rubles and income of the population per month $x_1 = 37{,}896$ rubles.

4 Conclusion

An important result of the considered model of stochastic optimization of economic-financial, informational and logistic inter-cluster interaction is that the increase of investments in the main capital does not always lead to population growth in the regions of the federal district (Fig. 4). The population of innovation-industrial clusters is interested primarily in the growth of its average per capita income. This needs to be taken into account when reallocating investment and human resources within one federal district. A temporary reduction in investment in fixed assets and a simultaneous increase in incomes of the population in a particular region of the Federal District can lead to more serious population growth, compared with a situation where the lack of the population's income is offset by growth in investment of fixed assets.

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Consolidation Activities of Universities in the Digital Economy

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Abstract The main purpose is to study the problem of timely adjustment of strategic priorities and strategic planning tasks for the educational organization of higher education. It affects the organization's ability to react quickly in the strategic development and provide the necessary level of competitiveness in the digital economy. For this reason, the priorities of the strategic development of universities are the search for strategic partners and focus on the problems of networking in order to achieve a consolidated result. Networking as a strategic task for pedagogical universities is of paramount importance in the context of financial and resource constraints of both educational organizations of this type and the main stakeholders (network partners, employers). The article summarizes the experience of modern forms of interaction between universities and organizations in various fields of activity; considered options for the formation of partnerships, including the "consortium" format in the digital economy. Possible grounds for the formation of associations and participation in such associations are described. The article presents the results obtained from the analysis of key indicators of pedagogical universities from the point of view of the prospects for their advancement in the program of strategic academic leadership. Based on the results of the study, conclusions were made about the prospects for the participation of pedagogical universities in various associations and promotion in the program of strategic academic leadership. As a result, the conducted assessment allows us to conclude that it is possible to use various forms of interaction between pedagogical universities as promising and priority areas of strategic activity that contribute to the growth of university performance indicators and the effective implementation of their strategy.

Keywords Strategic planning · Strategic academic leadership · Stakeholders · Strategic partnerships · Strategic development of the university · Performance indicators · Consortium

JEL Codes Y 800

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1 Introduction

The processes of globalization, internationalization, and digitalization of education are responsible for the continuous growth of competition between higher education institutions. In addition, changes in the requirements of potential applicants and employers determine the need for adaptations in all types of university activities. Development of the digital economy exacerbates the problems of strategic leadership between universities and creates a new type of competition: universities are considered, first of all, as innovative platforms that provide high-quality training and retraining of personnel for various industries; high-quality public and professional communications, taking into account regional and trans-regional interests; conventional interaction between generations (Falqueto et al. 2020).

Strategic planning in the digital economy is an integral part of the activities of universities around the world, since it allows, on the one hand, to ensure the development of the university within the framework of established legal norms, to maintain the independence of the university, its relevance in the economy. On the other hand, ensures the development of the university in the context the global educational and research agenda (Jalal and Murray 2019). The presence of clearly defined goals, objectives, strategic indicators, and indicators makes it possible to identify the competitive advantages of the university, determine the most effective areas of development, maintain stability as a subject of economic activity, and increase the reputation capital in educational, scientific, international, innovative and social activities (Cai 2019; Gavin et al. 2016).

Their strategy depends both on the internal potential of the organization and on external factors, and its development is a continuous process of improvement and actualization (Vladimirov 2012). Based on this, strategic planning becomes progressively cyclical adaptive nature; the decisive are the external factors and the analysis of their impact on the activities of organizations (Lizunov 2018; Myalkina et al. 2015; DeVaney et al. 2020).

At the moment, the need for effective strategic planning, participation in the implementation of strategic tasks at the regional and national level (participation in national projects, in the program of strategic academic leadership, in regional and trans-regional projects) are facing universities in the medium and long term, necessitate a revision of traditional approaches for activities of the university as a separate educational and scientific unit. The scale of problems to be solved in many ways determines the necessity of uniting efforts of universities with other organizations. It forms the position, which is based on common strategic ambitions, ensuring the quality of education, science and innovation, and other activities of all participants (Guzairov 2005).

2 Materials and Method

The main effects of network cooperation of educational organizations are indicated: expansion of the resource base used in educational activities, the possibility of using the best practical experience of partner organizations, timely updating of educational programs, development of personal qualities and communication competencies of students in the context of adaptation to other educational cultural environments (Korneev and Korneeva 2015; Gavin et al. 2006).

Problems of network activity of universities were considered in the works of L.P. Alexeyeva, E.A. Gnatyshina, M.B. Guzairova, D.N. Korneeva, N.Yu. Korneeva, S.V. Korshunov, P.V. Lizunov, A.V. Savchenkov, A.S. Tepkov, et al. (Alekseev 2013; Gorshenin et al. 2008).

In their studies, the authors note the importance of collaboration between universities and employers in order to improve the quality of training and to attract additional financial resources (Aleksandrovna et al. 2018; Dowsett 2020).

Solving the problems of national development requires the formation of an integrated approach to the consolidation of efforts of educational institutions of higher education in the format of network interaction (Krasnova and Teslenko 2017; Savchenkov and Gnatyshina 2015; Highman 2019).

For educational institutions of higher education may participate as a partner in a variety of associations, subject to the interests of all stakeholders: staff, students, employers, government agencies at various levels.

Russian universities are active participants in associations in the format of consortia formed in accordance with the principles of a territorial or sectoral community of interests:

- "Big University" in Tomsk is a project to create a special structure that will unite all six universities in the Tomsk region, as well as research institutes (SRI). Currently, the plans of the association include the implementation of large interdisciplinary projects, interdisciplinary educational programs, the development of new knowledge, and new technologies. https://www.riatomsk.ru/article/20191202/tomskij-proekt-boljshoj-universitet-oficialjno-zapuschen/
- Supercomputer consortium of universities of Russia consisting of: Moscow State University named after M. Lomonosov, NNSU of them. N.I. Lobachevsky, Tomsk State University, etc. The consortium was created to develop and ensure the implementation of a set of measures aimed at the effective use of the existing potential of higher education for the development and implementation of supercomputer technologies in Russian education, science, and industry. http: // hp c -russia.ru/
- Nizhny Novgorod Quantum Center (Nizhny Novgorod State University named after N.I. Lobachevsky, IAP RAS, Institute of Physics of Microstructures RAS, ZAO Vremya-Ch was established with the aim of developing human resources, creating joint educational programs, laboratories, start-ups, interacting with industrial and financial partners, and developing international cooperation. http://www.unn.ru/site/about/news/v-nizhnem-novgorode-budet-sozdan-kvantovyj-tsentr

3 Results

In this context, the priority tasks for universities, including pedagogical universities, are: formalizing the status of a partner of an association (consortium) that meets the goals and objectives of the Program, ensuring financial support for the region, a founder or a state corporation and drafting a development strategy in accordance with the goals and objectives of the Program and consortium in accordance with the following options:

(1) Partnership in already existing consortia in accordance with the interests and activities of the university;
(2) Organization of a new consortium;
(3) Partnership in newly established consortiums.

Partners in the framework of the consortium's activities can be, geographically close organizations (including universities), as well as universities in other regions, uniting in accordance with the priority tasks of the consortiums.

Universities may consider participating in consortia of any type and may participate simultaneously in multiple consortia activities.

University resources: a system of modular training programs (basic and supplementary), the presence of methodological support, human resources, the availability of a new type of educational spaces, the existence of e-learning environment, experience in implementation of educational activities in the remote format.

Due to a wide range of interests, pedagogical universities can become members of various network associations and partnerships that solve problems in various fields of activity as curators of the educational and scientific-methodological component of network projects.[1]

To overcome the problems of resource constraints and improve the quality of training of specialists, educational institutions of higher education need integration with other educational organizations, as well as scientific and industrial organizations both at the regional level and within the framework of industry interaction.

Participation in associations, including in the "consortium" format and participation in the Strategic Academic Leadership Program, will improve the quality of training specialists in regional universities by expanding the potential of the resource base: material, technical, scientific, innovative, educational, and intellectual.

It is particularly important expansion opportunities through the integration of resources for pedagogical universities.

The scale of activity of pedagogical universities is small: up to 7 thousand students study in 2/3 of pedagogical universities (including, in more than 80% of universities, full-time students are less than 4 thousand people) (Fig. 1).

[1] Discover Erasmus+. The new EU program for education, training, youth, and sport for 2014–2020. Minin Nizhny Novgorod State Pedagogical University (Minin University), Nizhny Novgorod, Russian Federation. URL: http://ec.europa.eu/programmes/erasmus-plus/discover/index_en.htm (Data accessed: 01.08.2020).

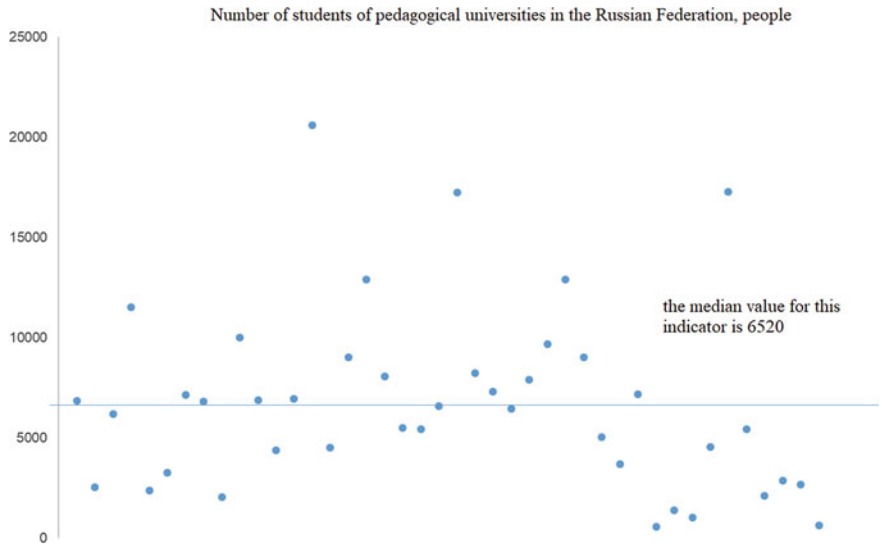

Fig. 1 Distribution of students in pedagogical universities of the Russian Federation. *Source* Compiled by the authors: Ekaterina P. Sedykh, Valeria A. Zhitkova, Anna V. Lapshova, Galina A. Paputkova and Anna V. Khizhnyi

In more than three-quarters of pedagogical universities, the number of full-time scientific and pedagogical workers is less than 350 people (Fig. 2).

The volume of income from all sources of more than 70% of universities is less than 800 million rubles (Fig. 3).

Of the three mandatory criteria for entering the Strategic Academic Leadership Program, the most problematic in terms of growth for pedagogical universities is the number of students enrolled in higher education programs. Among pedagogical universities, about 17% of universities satisfy the criteria for the number of full-time students. 14% of pedagogical universities meet the criteria for the volume of income from all sources, more than 26% of pedagogical universities satisfy the criteria for the share of R&D revenues in the total income of a university. At the same time, 5% of universities meet all three criteria, and 10% of universities meet two of the three criteria.

The assessment makes it possible to conclude about the importance of participation of pedagogical universities in various associations, including in the "consortium" format for expanding the resource and financial capabilities of partners and the development of educational scientific, innovative, financial, and economic activities. Active networking of pedagogical universities in the future will provide an opportunity for up to 15% of pedagogical universities to enter the Strategic Academic Leadership Program, which will allow achieving a multiplier effect in the implementation of strategic goals.

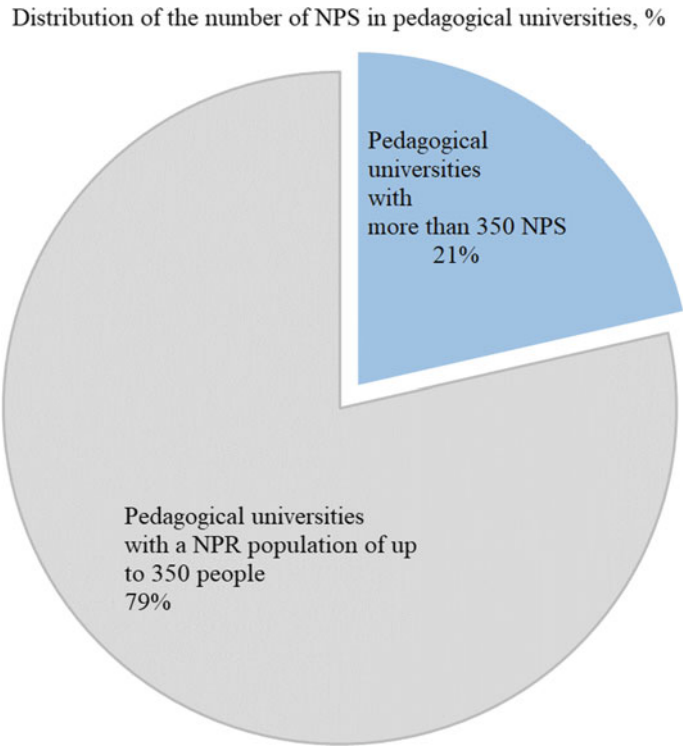

Fig. 2 NPR distribution of pedagogical universities of Russia. *Source* Compiled by the authors: Ekaterina P. Sedykh, Valeria A. Zhitkova, Anna V. Lapshova, Galina A. Paputkova and Anna V. Khizhnyi

4 Conclusion

This study allows us to conclude that the networking and participation in associations (including, in the "Consortium" format) for pedagogical universities is a prerequisite for the range of activities for development and growth, as well as one of the strategic planning priorities.

The university can become a party to a multilateral agreement with representatives of regional authorities and representatives of state corporations in order to improve the quality of educational and scientific-innovative activities, as well as to receive additional extra-budgetary income by the university. The most promising form of association is a consortium. Goals and objectives of the university development strategy should be consistent with the goals and objectives of the association (consortium), within which the university will carry out its activities.

The goals and objectives of social regional development, as well as priority goals and objectives of the development of industries, for which universities train specialists, are the closest ones for universities (including pedagogical ones).

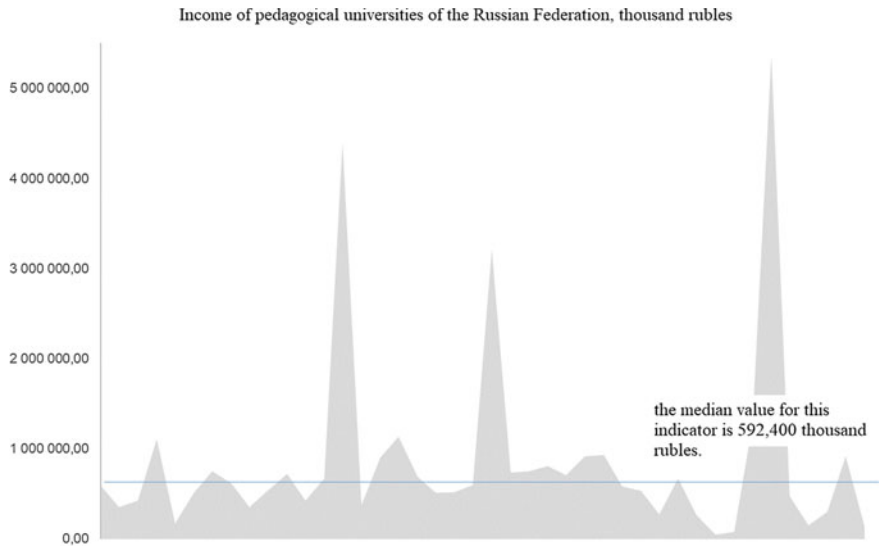

Fig. 3 Income of pedagogical universities in the Russian Federation. *Source* Compiled by the authors: Ekaterina P. Sedykh, Valeria A. Zhitkova, Anna V. Lapshova, Galina A. Paputkova and Anna V. Khizhnyi

Today, the existing scale of activity of pedagogical universities does not allow most of them in the near future to become full participants in the Strategic Academic Leadership Program initiated by the Ministry of Science and Higher Education of the Russian Federation. In this regard, it is necessary for pedagogical universities to intensify participation in network associations in the "consortium" format. In order to expand the participation of pedagogical universities in the general university movement, it is possible to introduce additional criteria for the entry of such universities into the Strategic Academic Leadership Program.

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Employee Skills Management: Competitiveness in the Digital Economy

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Abstract The purpose of the article is to change the skills of employees in organizations and their transformation in a digitalized society. The authors analyze the change in economic space in the industry 4.0., which has caused changes in different business processes that occur in society. They rely on research by leading scientists who consider changes in the key skills of a modern specialist in the context of global digitalization, and highlight the birth of a new format for the "information worker", which should have a number of key digital skills: working with information, and creating effective content. Based on the analysis of research data, it was found that the digital content that the employee is currently faced with has special requirements for the personnel management process. Personnel management should be aimed, on the one hand, to increase the competitiveness of the organization, and on the other hand, equal opportunities to solve organizational issues, as well as reduce costs and efforts in order to get results from employees. The authors made a forecast for the development of 9 key skills that are leading the staff of any organization for 2020. Their level is established that is currently formed in average values for Russia; areas of training in these skills are highlighted. The analysis of the prevalence of assessment tools for students in organizations of Nizhny Novgorod. The study carried out has significant prospects for further research related to the study of the development and formation of digital skills of the staff in enterprises taking into account the specifics of its functioning.

Keywords Digitalization · Digital transformation · Personnel management · Skills · Digital skills

JEL Codes J24 · O15

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1 Introduction

A few years ago, the main objectives of the study of human resources management processes were the problems of productivity, efficiency and competitiveness. The current situation, the "digital reality" and time outsourced by industry 4.0 have shifted emphasis to the issues of adaptability and sustainable development of economic systems through not only rational, but optimal labor management (Cologne Institute for Economic Research (IW) and Aachen University and Aachen University 2015; Zhou 2015). All this can be achieved by means of analysis of big data based on machine learning.

Digitalization is a catalyst for the development of business innovation. It brings many opportunities, but it also creates new challenges, in particular, companies need to understand how to use digitalization tools to increase productivity and how to develop personnel in a digital environment.

In order to successfully conduct business in digital environments and adapt to changing conditions, it is necessary to develop soft skills (such as social, behavioral, cognitive), and not just technical competence, which, undoubtedly, remains the most demanded.

Accelerating the pace of scientific and technological progress and ongoing technological changes contributes to the formation of digital skills, all this creates a new challenge for world education in the field of education. These challenges include a number of areas in which work requires immediate joint action by educational institutions, the business environment, companies and governments (McKinsey Global Institute 2017).

All this testifies to the relevance of studying current trends and personnel management systems in the new digital economy. This work examines the digital skills required by staff in a modern organization.

Since the topic of ownership and development of digital skills of students is a rather broad topic, in this paper we will focus only on the sociological aspect of the study on the use of the Internet by students of Russian universities.

2 Materials and Method

The transition to industry 4.0, the massive use of cyberphysical systems to provide human needs is transforming the familiar economic space. Systems of artificial intelligence and the Internet of things, a cybernetic approach to business management are the determinant of strategic success. The personnel competitiveness management system includes methods of influencing the organization's employees in order to ensure maximum consistency between their psychological characteristics, values and goals of the organization. Optimal human resource management in the new digital economy is machine learning.

Leading Fortune 500 companies such as Google, Microsoft, Apple, Amazon—use machine learning to create innovative products; Pinterest, Yelp, NextDoor, Disqus, as well as Google—in the management of user content; Lyst and Trunk Archive in e-commerce; to help users find relevant information—Google, Rich Relevance, and Edgecase. Large companies also use machine learning to manage various business processes, predict consumer behavior and customer service (Sedykh and Zhitkova 2019; Gruzdeva et al. 2020).

Optimization of personnel management processes; minimization of costs associated with them; the costs associated with hiring inappropriate candidates, reducing human errors in the hiring process—and this is not a complete list of what machine learning algorithms can optimize in the management process. Total automation will lead to a fundamental change in the management system, to the use of databases formed on the basis of cybernetic approach in the field of business and government control of data drive decision will replace the approach of HiPPOs (Highest-Paid Person's Opinions) (Evstafiev 2018; Koren 2010; Nayak 2015).

So, for example, to solve the problems of personnel recruiting, it would be most appropriate to use a type of machine learning such as precedent training, or inductive training, which is based on the identification of general empirical patterns from private data.

An ideal employee in the digital economy is an "information worker" who shares a system of corporate values, is able to select the necessary information and create a new one from the many existing options.

What does the ideal employee of the future look like and what is "the most valuable knowledge and qualification" in the digital economy? First of all, these are the abilities of an "information worker" sharing the system of corporate values, to select, analyze and work with the necessary information content and be able to model new information with targeted content.

Moreover, among the most significant professional skills are cognitive and systemic abilities, skills for solving complex problems, creating and processing content. It is not the employee's specific specialization that comes to the fore, but the ability to adapt, "self-programmability" and "self-learning". The digital economy shifts the educational emphasis from "sustainable specialization" to "optimal adaptation" of the individual. From qualification requirements, the market moves to requirements for competence, the ability to make decisions in conditions of uncertainty, and to organize joint work. Assessing the employee's potential passes through an assessment of the adequacy of his reaction to changes in the information space (Zatepjakin 2015; Lyaskovskaya 2017; Sotnikova 2014; Schwab 2016).

Another undoubted advantage is that digitalization has changed the basic principles of office work. Thanks to the automation of many operations that no longer require the use of manual labor, modern employees do not have to become attached to a specific place of work. In the world there are many professions with the ability to remotely access work. Thus, the staff has more time directly for performing labor functions, as well as for personal development.

Some companies are introducing various applications that make it possible to conveniently and quickly receive information and share it with colleagues. Examples of such applications include:

1. Resume Matching—finds the most suitable candidate in the database by making a request for the corresponding vacancy;
2. Job Standardization—makes it possible to find a vacancy with an existing job description, name, and salary;
3. Employee Flight Risk Prediction—predicts the likely quitting of employees from the organization;
4. Conversational AI Platform—provides automated assistants to resolve issues.

In personnel management, digitalization is aimed at creating a convenient digital environment for employees, the main purpose of which is to reduce the time and effort required to obtain a result. For example, using your personal account, you can arrange a vacation or business trip using a ready-made sample (Listikova et al. 2020). Another advantage of using IT technologies is the organization of distance learning, thanks to which employees can improve their skills and find interesting materials at a convenient time (Vaganova et al. 2019).

The purpose of the study: to learn the skills necessary for staff in a digital environment.

Research objectives:

- explore the main directions of digitalization in organizations;
- explore the digital skills that staff need in a modern organization;
- assess the relevance of skills in a digital environment.

The methodology of this study was based on the following scientific methods. One of the key methods used in the analysis of large amounts of information is content analysis. The method implementation procedure allows us to analyze and evaluate a large array of data on the use of artificial intelligence systems in human resource management, determine the most applicable techniques and technologies, highlight successful practices, etc.

Other important methods for studying digital skills implemented in the preparation of this article include the methods of systematizing and structuring research results of large companies (McKinsey Global Institute, IBM, KPMG, CEB SHL) on these problems.

The theoretical basis of the study was the work of specialists actively studying the development of digital skills of staff.

3 Results

At the beginning of the study, it was necessary to find out what digital skills should be developed among the personnel of a modern organization.

Based on an analysis of the results of the CEB SHL 2019 study (the list is based on the most popular digital skills in the USA, UK, Australia, China, Germany, South Africa), the 20 most demanded digital skills can be identified, among them working in environments/knowledge of digital products:

Java Microsoft NET Framework
Microsoft SQL Server Technical Support
Structured Query Language (SQL)
Python
Linux Big Data
Customer relationship
Management (CRM)
System integration
Javascript unix
Hypertext Markup Language (HTML)
Systems Development Life Cycle (SDLC)
Cascading Style Sheets (CSS)
Extensible Markup Language (XML)
C/C ++ Web Services
C# Instrumentation.

Further, on the basis of the analysis of a number of studies, a forecast of the demand for key skills necessary for personnel in 2020 was formed. Figure 1 shows the forecast of 9 key skills at the end of 2020 and the current level of formation.

Let us characterize the situation by the formation of 9 key skills at the beginning of 2020 in average values for Russian organizations.

1. Cognitive abilities—15%;
2. System skills—17%;
3. Integrated problem solving—36%;
4. Content creation skills—10%
5. Process skills—18%;

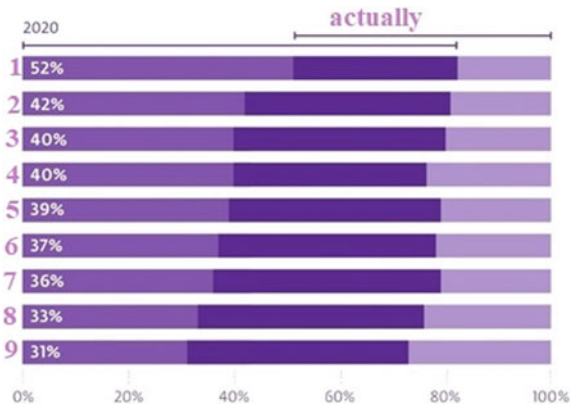

Fig. 1 Demand level for 9 key skills for staff in 2020. *Source* Compiled by the authors using the Analytical report ANO DPO "Sberbank Corporate University" (2020)

6. Social skills—19%
7. Resource management skills—13%
8. Technicalskills—12%
9. Physical abilities—4–12%

Thus, the skills associated with digital support activities are leading.

These results are confirmed by data obtained from a study of global companies conducted by IBM in 2018–19. This study was devoted to the development of relevant skills among staff, the sample was 5600 managers. Half of the respondents surveyed believe that the companies themselves are responsible for developing the necessary skills for employees, and only 39% of the respondents believe that employees themselves must develop and maintain their professional skills.

As for the development and training of digital skills, the main problems identified by the respondents are primarily associated with low motivation of staff to develop special digital skills. Therefore, according to the results of the study, it is necessary to develop programs to stimulate learning of a monetary and non-monetary nature.

According to KPMG, a significant part of employees, in the absence of special requirements from the employer, are not interested in training and developing digital skills. One of the most constructive solutions in this situation is corporate training in digital skills during the interaction of training and business departments of the company.

However, there is no standard methodology for assessing the success of the transfer of acquired skills to the workplace. The solution to this problem is also complicated by the lack of direct interaction between different departments in determining the functionality of digital learning systems (Smirnova and Kochnova 2019; Vaganova et al. 2020).

Ideologists for designing corporate digital learning programs in organizations tend to be HR departments. However, the tools that they use to evaluate personnel are poorly integrated with the technological basis of training systems.

A reflective assessment of the training quality is also separated from the opportunities that many virtual learning environments provide, for example, such as Moodle. The lack of a formalized assessment of the educational impact is another problem faced by organizations that have chosen the corporate way of training staff in digital skills. This is primarily due to the lack of evaluative tools that should be adequate to the task of developing digital skills.

An analysis of the prevalence of student assessment tools among 110 companies in Nizhny Novgorod revealed that: the results of the study are used as an assessment tool in 52% of cases, tests in 59%, workplace productivity is used by 15% of companies, 4% prefer simple performance assessment, and other tools 40% and none use - 9% of companies.

All this indicates the need to strengthen the transition to digital support for personnel activities and to increase the level of readiness of company management to digitalize their activities.

4 Conclusion

The study allows us to state that digitalization has already firmly entered into the modern management of companies not only in the world, but also in Russia. Modern technological challenges of the time form the requirements for the availability of digital skills among staff. The management process is increasingly becoming more transparent and digital technologies are fully contributing to this.

Summing up, we can distinguish the main tasks in personnel management taking into account digitalization:

- Organizations must develop their own behavioral strategies in a digital economy;
- Within the company it is necessary to exchange digital strategies and experience for further development;
- Focus on training and development of digital skills of staff of the organization;
- Expand and develop digital thinking, as well as transfer practical experience with a view to further application.

The study has significant prospects for further research related to the study of the impact of digitalization on personnel management, and its development.

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Management of Teacher Training in the Digital Economy

Irina B. Bicheva, Natalya V. Belinova, Larisa V. Krasilnikova, Tatyana G. Khanova, and Anna V. Hizhnaya

Abstract The purpose of the publication is to design methodological support, providing an extension in the level of professional and methodological training of teachers for economic preschool education tasks fulfillment in the context of digitalization. The methodology of the article is based on a theoretical and experimental study of the problem under concern, which allowed us to define professional and methodological readiness of teachers in the field of economic preschool education and highlight assessment criteria. A scientific and theoretical analysis of the problem of economic preschool education is carried out. It is illustrated that the design of methodological support in accordance with the principles of system-activity and individually-differentiated approaches, management of professional development based on the vitagenic experience of teachers and current trends in the development of economic preschool education is a promising direction for increasing the level of professional and methodological readiness of teachers. A methodological work plan is proposed, a feature of which is the development of the content and forms of methodological support, recommended report forms, and the level of their presentation. The importance of humanitarian technologies in the process of its implementation is emphasized. Testing results indicate a significant increase in the level of professional and methodological readiness of teachers in the field of economic preschool education. The professional and methodological readiness of teachers to implement the tasks of economic preschool education is defined by the authors as a complex of interconnected components: motivational-value, substantive, procedural, reflective-evaluative. Three levels of its formation are proposed: optimal, sufficient, critical.

Keywords Economic preschool education · Teacher of preschool education · Vocational training · Methodological support · Design of methodological support

JEL Codes I2 · M5

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1 Introduction

Vocational training of the teacher's personality in the context of information social development and the development of the digital economy is an important factor in the innovative transformations of educational systems at various levels. Wide access to infrastructure services and a range of digital services provide the opportunity for more effective management of professional self-development and development of each teacher.

Modern requirements for the professional activity of a preschool education teacher necessitate the achievement of a high level of development of methodological training, which allows to qualitatively solve the problems of education and development of preschool children, including in the field of economic preschool education (hereinafter—EPE). Scientific, methodological and didactic aspects to the organization of economic education of preschool children are revealed (Bicheva et al. 2019a,2019b; Bicheva and Stepanenkova 2019; Bicheva and Filatova 2019; Gladkova and Kolomiychenko 2018; Prokofiev and Seryakova 2018; Khanova and Prokofieva 2018) and others. The design of methodological foundations and content of professional development of teachers of vocational and preschool education are considered (Belinova and Fonareva 2019; Belinova et al. 2020; Bicheva and Filatova 2019; Bicheva and Khizhnaya 2018; Bicheva et al. 2019a,2019b; Bicheva and Stepanenkova 2019; Vaganova et al. 2019; Sidyakina and Lysakova 2016).

Basically, the problem of EPE is concerned in relation to children: its goals, objectives, content, forms and methods are determined to provide the formation of elementary economic ideas with preschoolers which is highlighted in works by Bicheva and Stepanenkova (2019); Bicheva and Filatova 2019; Prokofieva and Khanova 2018). However, the quality of work with children in this area mainly depends on the level of competency of teachers of preschool educational organizations.

This article solves the following task: set forth the design of methodological support, providing an increase in the level of professional and methodological training of teachers for the implementation of EPE tasks in the context of digitalization.

2 Materials and Methods

Theoretical conclusions are based on scientific and theoretical analysis of studies that reveal the problem of EPE, which allowed to highlight the components of professional and methodological readiness of teachers for the implementation of EPE objectives. The conclusions are based on the data of a diagnostic study of the level of their formation among teachers of preschool educational organizations in Nizhny Novgorod, Russia.

3 Results

We consider the professional and methodological readiness of teachers for the implementation of EPE tasks as a complex of interrelated components: motivational-value, substantive, procedural, reflective-evaluative.

The motivational-value component is expressed in the fact that the teacher, realizing the need to solve the problems of EPE as an important task of sociocultural development and economic socialization of the child, is aimed at achieving a qualitative result, longing to develop own creative experience, its replication and demonstration.

The content component characterizes the teacher's ability to provide search and selection of relevant information in the field of EPE, to carry out its critical analysis and evaluation, mastery of the content of programs, technologies, forms and methods of EPE, the competency to plan and organize the educational process, to design an economic subject-spatial development environment in interaction with parents.

The process component reflects the teacher's competency to flexibly apply educational technologies, forms and methods of work, taking into account the peculiarities of perception of the proposed content by children, the ability to show readiness for open and partner interaction with children, colleagues and parents of pupils, managing communicative interaction in solving EPE tasks.

The reflective-evaluative component is characterized by the teacher's competency to conduct self-analysis of own professional activity, determine professional achievements and difficulties, objectively correlate and evaluate real results with the curriculum requirements and the prospects for the development of EPE.

Three levels of professional and methodological readiness of teachers for the implementation of EPE tasks are identified: optimal, permissible, critical. At the optimal level, the components of professional-methodological readiness are constantly and systematically manifested, on the permissible level— fragmentary and episodic, at the critical level—partially or not expressed.

The process of developing professional and methodological training of teachers in the field of EPE determines the design of methodological support in accordance with the principles of system-activity and individually-differentiated approaches, managing professional development of teachers based on vitagenic experience, taking into account current trends in the formation of elementary economic ideas and experience with preschool children and their application in practice.

The main substantive areas of methodological support for teachers in the field of EPE are:

- variable complex and partial programs that reveal the features and content of EPE;
- modern EPE technologies, forms and methods of forming elementary economic representations with preschoolers;
- designing an economic subject-spatial development environment that motivates children to study economic concepts, gaining experience in socio-economic relations in the process of joint activities;
- planning educational work with children on the formation of elementary economic ideas;
- interaction with parents to solve the problems of economic education of children.

The provisions considered were the basis for developing the structure and content of work plan to increase the level of professional and methodological readiness of teachers in the field of EPE in accordance with its actual level (Table 1).

The process of methodological support of teachers was carried out as a tutor support in the development of content and technologies for working with children. The application of humanitarian technologies (design, discussion, individually differentiated, information and communication, reflective, etc.) made it possible to master the necessary content through research practices, professional tests, analysis and understanding of a professional event (situation), the participation of teachers in conferences at various levels, competitions professional excellence. The use of such forms ensured the systematization of the acquired experience, the realization of the teachers' need for professional success, contributed to the development of independence, professional enrichment through acquaintance with the best pedagogical practices.

The introduction of multimedia technology ensured the formation of an information culture, the acquisition of skills for processing large amounts of information, the possibility of communication and cooperation based on computer communication tools (Bicheva and Khizhnaya 2018; Bicheva et al. 2018; Prokhorova and Vaganova 2019; Bulaeva et al. 2020; Smirnova et al. 2020; Yashkova et al. 2020).

Assessing the results of testing the proposed work plan, it should be noted that its content, forms of methodological support, as well as recommended forms of reporting help to increase the level of professional and methodological readiness of teachers to solve EDL problems. This is evidenced by a study in which 16 teachers of older age groups of preschool educational organizations in Nizhny Novgorod, Russia took part (Fig. 1).

Table 1 Designing of work to increase the level of professional and methodological readiness of teachers in the field of economic preschool education

Readiness level	The content and forms of methodological support	Educational product/report form	Presentation level
1	2	3	4
September			
Topic: "Analysis of software and methodological materials for EPE"			
Optimal	Research practice: "Comparative analysis of educational programs of EPE"	Analytical report/presentation	Methodical consultation at the kindergarten
Valid	Methodical advice: "Program and methodological requirements for the content of EPE" Workshop on Economic Terms	Report/presentation Economic Dictionary of Preschooler Methodical bank of electronic educational resources	Pedagogical parlor for parents: "How to teach a preschool child the basics of economics" Registration of the economic library in the kindergarten
Critical	Individual consultations: "Electronic educational resources in the economic education of preschool children"		Exhibition for Teachers and Parents at the kindergarten Registration of an economic library in a group
October November			
Topic "Modern technology of economic education of preschool children"			
Optimal	Discussion: "EPE Technologies" Individual consultation: "Features of a master class "	Master class: "Problem-game technology EPE /Publication	Competition of pedagogical excellence at the kindergarten International (Federal, Regional) Conference
Valid	Workshop: "The use of modern EPE technologies in the educational process"	Drafts of pedagogical events using tasks, models, subject-didactic games, production exercises	Competition of pedagogical proficiency at the kindergarten
Critical	Group consultation: "Forms and methods of EPE" Analysis and discussion of specific situations on EPE	Plan of a pedagogical event based on literature works of economic content	Competition of pedagogical proficiency at the kindergarten

(continued)

Table 1 (continued)

Readiness level	The content and forms of methodological support	Educational product/report form	Presentation level
December–January			
Topic "Designing the economic subject-spatial environment of the group"			
Optimal	Discussion and identification of initiatives	Design project of the economic subject-spatial environment of the group/photo report	Mutual Visits of kindergartens Placing photos on the website of the kindergarten
Valid	Problematic seminar: "Requirements for the design of the economic subject-spatial environment of the group"	Project "Advertising agency"/photo report	
Critical		Project (optional) "Supermarket", "Atelier"/photo report	
February–March			
Topic: "Planning the educational process for EPE"			
Optimal	Individual consultation: "Requirements for authoring and its design"	Authoring/presentation	Joint Pedagogical Council of kindergarten District methodological association
Valid	Group consultation "Integration of economic content in different types of children's activities" Workshop: "Features of the development of a work plan for the economic education of children"	Annual work plan for EPE tasks	Joint Pedagogical Council of kindergarten District methodological association
Critical		Monthly Work Plan for EPE Tasks	Joint Pedagogical Council of kindergarten
April–May			
Topic: "Interaction with parents to solve the problems of EPE"			
Optimal	Individual consultations: "Studying the experience of family economic upbringing and education of children"	Analytical report/presentation	Economic auction with children and parents of kindergarten Round table for group parents
Valid	Methodical workshop: "Attracting parents to joint activities to solve the problems of EPE" Group consultation: "Design of the parent corner"	Abstract of economic quiz/photo report in the parent corner	Quiz with children and parents of the group: "I know the economy!"
Critical		Memos, booklets/design of the section "Secrets of the preschool economy"	Consultation for parents of the group: "Home Economics"

Source Compiled by the authors based on the study (2019)

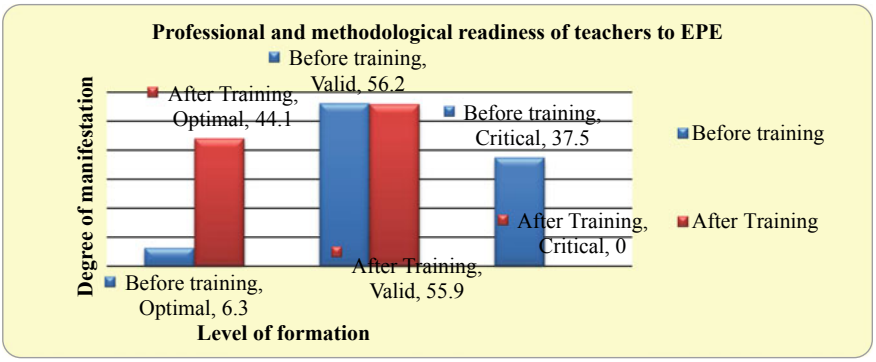

Fig. 1 The level of professional and methodological readiness of teachers in the field of EPE, %. *Source* Compiled by the authors based on the study (2019)

As can be seen from the data obtained, before training, most teachers showed acceptable and critical levels of professional and methodological readiness in the field of EPE (56.2% and 37.5%, respectively). After training, teachers showed optimal (44.1%) and acceptable (55.9%) levels. A critical level after training has not been identified. Consequently, teachers mastered the necessary scientific, psychological, pedagogical and methodological knowledge, technologies in the field of EPE, methods for their systematic acquisition, application, transformation and replication in a professional environment. The activity of teachers of various levels of vocational and methodological preparation for further study of EPE, the awareness and objectivity of assessing professional results, has significantly increased. The individuality of methodological support and the presentation of reporting results was especially noted, which contributed to the achievement of professional success by teachers, since they took into account real work experience.

4 Conclusion

It can be concluded that the focused design and study by teachers of various aspects of EPE is a promising area of methodological support in a preschool educational organization.

The implementation of the proposed work plan helps to increase the level of professional and methodological training of teachers for the implementation of EPE in the context of digitalization. The use of modern video technology allows to recreate the real situation in the process of managing the professional and methodological training of teachers.

Methodological support, carried out in a dialogue-based nature of content development and use of various electronic devices, provides the necessary cultural organization, information openness and comprehensiveness, individual motivation, cognitive-creative and developing character of the process of professional and methodological training of teachers in the field of EPE.

Given that the content of EPE is implemented primarily in partial educational programs, increasing the level of professional and methodological readiness of teachers will allow more efficiently design and organize additional educational services, ensuring the satisfaction of the child's educational needs in the formation of elementary economic ideas and enriching the experience of their use in practical situations.

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The Relationship Between the Workers Competitiveness and Their Labor Mobility in a Digital Economy

Alexander L. Mazin, Anna A. Troitskaya, Victor P. Kuznetsov, Natalia V. Shmeleva, and Elena E. Frantseva-Kostenko

Abstract The purpose of the article is to analyze the impact of the labor mobility of an employee on his competitiveness and propose measures to strengthen the competitiveness of Russian workers in conditions of mass introduction of digital technologies. The competitiveness of employees is characterized by their ability to get ahead of their competitors in competition for jobs, career advancement and terms of employment. Among the factors that determine it, the potential for employee labor mobility is especially important. A positive relationship between the potential for labor mobility and the competitiveness of an employee is confirmed by the results of the study conducted by A. L. Mazin and A. A. Troitskaya. In the context of the digital economy development, the role of the employee's labor mobility potential is not only growing, but also transforming. In the future, the high mobility potential will be manifested in a willingness to learn new specialties, acquire new knowledge and competencies, learn new professions, especially those that have not yet been mastered or mastered by less intelligent machines (computer algorithms). Russia is significantly behind in the development of the digital economy. The Russian government has developed a program for its development. In the coming years, it will become one of the priorities, and we need to prepare for the solution of labor market problems related to the competitiveness of workers in the digital era. The article contains proposals aimed at improving the competitiveness of Russian workers in the new conditions. There are changes in the system of higher education. It is necessary to significantly strengthen the professional and social support of middle and senior workers (including pre-retirement) in the labor market.

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Keywords Labor market · Employee · Competitiveness · Labor mobility potential · Digital economy · Computer algorithms · Professions

JEL Codes J20 · J24 · J60

1 Introduction

Competitiveness of employees has a significant impact on the nature of their relationship with employers, the level of earnings, working conditions, and the development of the economy as a whole. Among the factors determining the competitiveness of an employee, a special role belongs to the potential for labor mobility, reflecting his ability to change the workplace (position) in his organization or employer in the external labor market (regional, country, international). In the context of the digital economy development, serious changes are taking place in the labor markets of many countries, especially developed ones, while the role of the potential for labor mobility as a competitive factor is not only growing, but also transforming. This is relevant for modern Russia.

2 Theoretical Basis of Study

A lot of publications are devoted to the competitiveness of employees, which offer various definitions of this category. According to Radko S. G. and Dembitsky S. G. "under the level of competitiveness of the employee should be understood the degree of compliance with psychophysiological, personal and professional qualification characteristics of the employee in a certain sphere of labor requirements of the employer" (Radko and Dembitsky 2017). Many authors understand the competitiveness of the employee as his professional qualities, taking into account the benefits that he brings to the enterprise. At the same time, the criterion of competitiveness is the compliance of an employee's qualifications with the characteristics of the workplace that he occupies (Garmider 2018).

A different approach, taking into account the relationship of an employee's competitiveness with the competition process in which he or she is or may be involved, seems to be more justified. A. L. Mazin believes that competitiveness is the ability of the subject to ahead and win their competitors. It can be high or low—with corresponding chances of winning. At the same time, competition in the labor market occurs not only between employees (in hiring and career development) and between employers (in competition for workers), but also between an employee, on the one hand, and with an employer, and on the other, for terms of employment (Mazin 2013).

When studying the competitiveness of an employee, many authors note the role of various factors that make it possible to succeed in job search and career advancement

(knowledge, experience, reputation of personal qualities, etc.). Most of them are directly related to the human capital of the employee and his ability to benefit the employer and thereby find work, earn money, and advance in their career. Of course, human capital, as well as competitiveness, is possessed not only by hired workers, but also self-employed people (not to mention entrepreneurial employers), but their competitiveness is more likely related to the competitiveness of the product that they offer to consumers. An employee who offers employers their own labor (labor service) enters into competition with other employees in the domestic or foreign labor market, and as a result wins a more competitive one. As for the competition between the employee and his employer for the terms of employment (salary, social package, etc.), the balance of power in this struggle depends on many circumstances of an economic, institutional, professional and personal nature.

Among the factors affecting the competitiveness of an employee, the potential of his labor mobility is especially important, along with knowledge, experience and a set of personal qualities useful in a particular activity. This does not mean mobility as the process of moving to a new place of work, sometimes accompanied by a change in profession or place of residence, but the ability to such movement both within the organization and beyond.

In addition, the ability to change jobs strengthens the employee's negotiating position and makes him more independent in competition with the employer, reduces the threat of becoming a victim of his whims, sexual harassment, etc.

The potential labor mobility of an employee plays an important role in his competition with other workers. But is a mobile worker more valuable to an employer compared to a non-mobile one? Looking at the potential of what kind of mobility we are talking about—intra-company, inter-company, professional, territorial.

An employee with a high potential for intercompany mobility can work in different departments of the company, in different positions, he can be included in the personnel reserve, etc. All this increases its value in the eyes of the employer. More difficult is the potential for intercompany mobility. On the one hand, an employee who can be useful not only for his own, but also for other employers, deserves more attention, respect, and has the right to count on a high salary and good working conditions. On the other hand, there is a risk of his dismissal, and it is reducing the desire of the company to invest in improving his qualifications. On the external labor market, the high potential for intercompany mobility is usually useful: the person's chances of getting a job or continuing to search for a new one in case of job loss increase.

The potential of professional mobility of an employee (his ability to change not just a job, but also a profession, a field of activity) has been little studied in the literature. Meanwhile, recently, it is precisely this potential that has acquired a decisive role in the labor market as a result of phenomena and processes: the knowledge economy, the digital economy, the massive use of robotics, the appearance of smart (intelligent) machines, the spread of digital doubles, computer algorithms, etc.

The authors also used the materials from Order of July 28, 2017 No. 1632-r (Government of the Russian Federation 2021) and from International Federation of Robotics (2021) in this study.

3 Methodology of Research

In modern conditions, the concept of "employee competitiveness" is filled with new content, reflecting the onset of mass digitalization. The analysis of new trends has been the focus of numerous publications in foreign and Russian literature. Erznkyan B. A. and S. Arutyunan note that in 2016, according to the International Federation of Robotics, in the world there were more than 1.8 million industrial robots. Their number is growing rapidly and it is obvious that robots will be used in other industries, replacing not only physical but also intellectual labor (Erznkyan and Arutyunan 2018). Many authors note an increase in the number of professions where in the foreseeable future there is a high risk of replacing people with machines or, in the words of Yu. Harari, by computer algorithms (Harari 2018). According to C. Frey and M. Osborne, 47% of professions are in a high-risk zone and in the next 20 years or almost not needed, employees of such professions as an insurance agent, sports judge, cashier, chef, waiter, guide, baker will not be needed, bus driver, construction worker, security guard, sailor, bartender, archivist, carpenter, etc. (Frey and Osborne 2015).

There is a growing probability that artificial intelligence better person will be able to carry out specific actions that make up the essence of this or that profession, which already today begins to enter the "risk zone", including the field of management. For example, *Uber* coordinates the movements of millions of taxi drivers using a small number of operators, since most orders are given by computer algorithms without human intervention (Simonite 2015). According to experts, by 2030 automation will be at risk: in the USA—38% of jobs, in Germany—35, in the UK—30, Japan—21%.

However, a number of authors (B. Vermulen, Ya. Kesselhut A. Pika and P. Saviotti) believe that the disappearance of former professions will be accompanied by the emergence of new ones (Vermeulen et al. 2018). Equally optimistic about the prospects E. Brinolfsson, D. Rock and C. Siverson (Brynjolfsson and McAffee 2011; Brynjolfsson et al. 2021). Today, the emergence of new professions will be determined by the demand for competencies in such fields of activity as robotics, sensorics, neurotechnology, artificial intelligence, blockchain, the Internet of things, etc. (Garanin 2018).

4 Results

A positive relationship between the potential of labor mobility of an employee and his competitiveness is confirmed by the results of studies that were repeatedly conducted by A. L. Mazin and A. A. Troitskaya. By means of questioning, correspondence students who worked at the enterprises of Nizhny Novgorod and the region were interviewed. In particular, in 2011, 394 students of the Nizhny Novgorod Institute of Management and Business were interviewed, in 2018, 399 students of the Nizhny Novgorod Institute of Management, a branch of the RANEPA. Respondents were

Table 1 Correlation between intercompany mobility potential respondents and their level of salary in 2011

		Mobility	Wage
Mobility	Pearson correlation	1	.179(**)
	Sig. (2-tailed)		.001
	N	376	367
Wage	Pearson correlation	.179(**)	1
	Sig. (2-tailed)	.001	
	N	367	385

** Correlation is significant at the 0.01 level (2-tailed). Source Compiled by the authors

asked questions related to their income, potential for labor mobility, investment in education, labor discrimination, etc. (Mazin 2018). In particular, they were asked to evaluate the potential of their inter-company labor mobility on a 5-point scale and indicate the range in which their wages were at the time of the survey (in the calculation - mobility and wage variables are taking values from 1 to 5).

According to the results of the 2011 study, Pearson's linear correlation coefficient between these parameters was calculated. Data on both indicators were available in 367 of 394 observations. This coefficient is 0.179 and is statistically significant at the level of 0.01, which indicates the presence of a not very significant, but stable positive relationship between the indicators. Note that the employee's income level, even if indirectly, testifies to his competitiveness. The correlation between the answers is illustrated in Table 1 and Fig. 1.

A similar correlation was observed in 2018, but less pronounced: the correlation coefficient between the employee's assessment of the potential of his inter-company mobility and his salary was 0.100 and was statistically significant at 0.1. Data on both indicators were available in 377 of 399 observations. The correlation between the

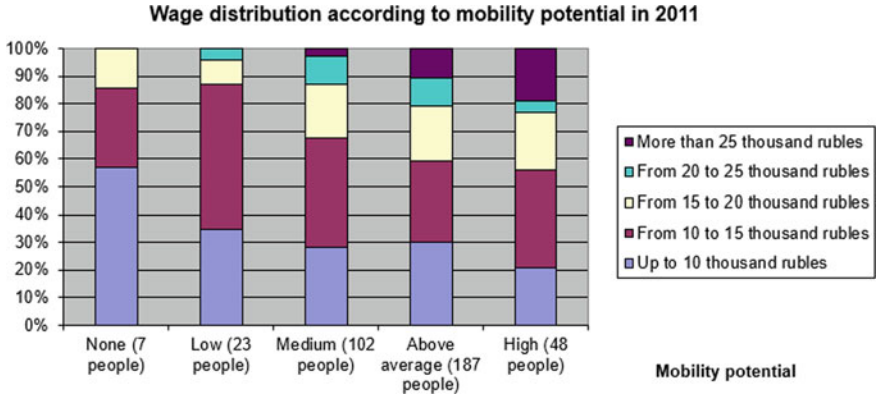

Fig. 1 The correlation of labor mobility potential respondents and their salaries in 2011. *Source* Compiled by the authors

Table 2 Correlation between intercompany mobility potential respondents and their salary level in 2018

		Mobility	Wage
Mobility	Pearson correlation	1	.100
	Sig. (2-tailed)		.052
	N	383	377
Wage	Pearson correlation	.100	1
	Sig. (2-tailed)	.052	
	N	377	393

Source Compiled by the authors

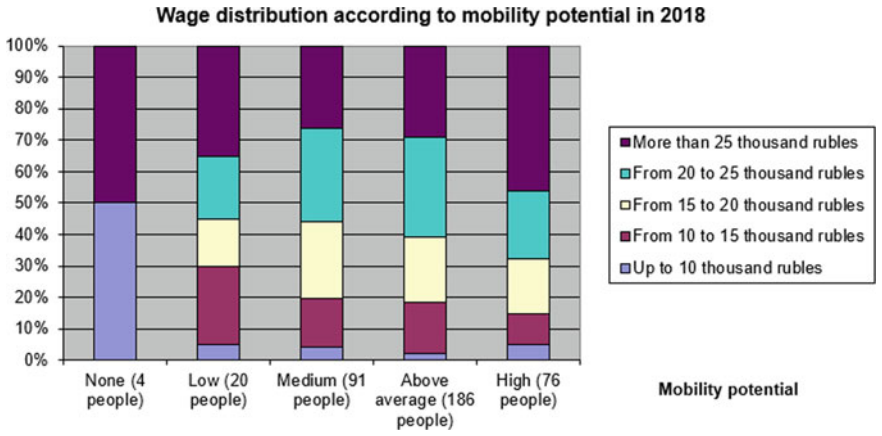

Fig. 2 The correlation of labor mobility potential of respondents and their salaries in 2011. *Source* Compiled by the authors

answers is illustrated in Table 2 and Fig. 2. Note that the first column of the diagram is uninformative due to the small number of observations.

In the context of mass digitalization, the search for such a role (position) in the labor market that will allow the employee not only to acquire, but also to maintain high competitiveness, both in the short and long term, becomes relevant. Moreover, it will have to compete not only with people, but also with machines, more precisely, with computer algorithms.

It is important, especially in young age, to find a competitive profession—one in which the risk of being replaced by intelligent machines is not so great. It is not easy to find: the situation on the labor market, especially in developed countries, is changing rapidly. Therefore, it is important to maintain the ability to master new knowledge and competencies, and not only in youth, but also in adulthood, and ideally in old age, although this, of course, is more difficult.

It is in this that the high potential of labor mobility of the employee will now manifest itself as a factor of his competitiveness: in readiness to master new specialties, acquire new knowledge and competencies, learn completely new professions,

especially those that computer algorithms have not yet mastered (or mastered to a lesser extent).

Creative professions in this regard look more reliable. Computer algorithms are hardly crowding out archaeologists: this work requires recognition of a complex system of images and does not promise large revenues, so it is unlikely that corporations and governments will invest in automation of archeology (Frey and Osborne 2015). Modern doctors have to spend a lot of time processing information: collect health data, analyze them, and diagnose patients. The nurse should be able to painlessly inject, change the bandage or calm down the violent patient. Therefore, a family doctor with artificial intelligence is more likely to appear on a smartphone than a-nurse's robot (Chui et al. 2016). Probably, in the field of social services caring for the sick children or the elderly people, will still retain an advantage in competition with cars. As for the new specialties that will appear, it will be important for them not only the complexity of their development, but also the ability of people to perform work better than computer algorithms (Brynjolfsson and McAffee 2011).

To what extent are the described trends related to digitalization relevant for Russia? Today, our country is significantly lagging behind in the development of the digital economy: according to the calculations of The Boston Consulting Group, the leaders here are the UK (12.4% of GDP), South Korea (8.0%) and China (6.9%) (Sukhodolov et al. 2017). In Russia, this indicator is significantly lower (2.8%), although the level of distribution and use of the Internet is significant: by the end of 2017, there were 87 million Internet users in the country, and 51.5% of the adult population had mobile access to the network (GfK Study, 2018). In 2016, 1031 jobs in South Korea accounted for 631 industrial robots, in Germany - 309, in Japan—303, in the USA—189, in China—68, in Russia—3 (GfK Study 2021).

In 2017, the Government of the Russian Federation developed a program for the development of the digital economy, in which it is defined as "economic activity, the key factor of production of which is digital data" (Government 2017). In 2020, judging by many signs (for example, the successful use of digitalization by tax authorities), the country will actively distribute digital technologies and introduce them into new areas of economic and public life.

How will these processes affect Russian workers? Would the most competitive ones want to leave the country? Today's trends do not inspire much optimism, given that for many years about 350 thousand people go abroad every year (Raizman 2013). So, 60% of Russians who win international competitions go to work abroad, and only 9% return (Yakovleva and Yukhlin 2014), and among young scientists only 26% would like to do science in Russia, while 63% would like to do it abroad (Tobien 2014).

5 Conclusion

In our opinion, the following actions are needed to enhance the competitiveness of Russian workers in the context of the massive introduction of digital technologies.

1. A revision of the educational programs of Russian universities is necessary, taking into account the growing role of new professions, using the experience of those countries in which digitalization processes are especially fast.
2. The emphasis in the period of study at the university is advisable to make on the formation of the student's ability and readiness to retrain throughout his life. Such ability (competence) may turn out to be more useful than knowledge itself—for all the importance of the latter.
3. In the future, it will be difficult for people of middle and middle-aged (including pre-retirement) age to find work in their specialty. A change of profession will require huge psychological costs and material costs, unbearable without the help of the government.
4. It is desirable that the most competitive Russian workers have the opportunity to find an application for their work energy in Russia. This requires a demand for innovation, including those related to the development of the digital economy. This demand can and will grow only with a radical improvement in the investment climate.

If the government's plans related to the accelerated development of the digital economy are not implemented, the threats described above for the majority of workers will not be affected. Or almost not affected. But this will mean irreparable technological lag of Russia from developed countries. This cannot be allowed. In addition, we must strive to ensure that mobile and competitive people feel confident that Russia has a future, where they will be needed.

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A Study of Young People's Attitudes for Work in the Era of Intelligent Machines

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Abstract The purpose of the scientific article is a sociological study of the role of student's value orientations, social and professional development of future workers and specialists and the role of professional educational institutions in the definition of life path, as well as the choice of future professions in the era of intelligent machines. In sociological, pedagogical, and economic studies, methods are widely used to collect opinions of students (questionnaires, interviews, and conversations). The questionnaires reflect issues related to the choice of profession, interest in employment; difficulties that students experienced in the learning process, the attitude towards production activities, and public life. The interview is used to identify the student's attitude to various pedagogical and industrial phenomena. In the conditions of the modern economic system, the digital economy and the era of intelligent machines, the task of preparing future workers and specialists with a high level of qualification and competitiveness of an employee in the labor market is coming to the fore. The choice of the future path of life is associated with the formation of social, labor, and professional values of youth. The development of value orientations of future workers is influenced by the following factors: level of professionalism, desire to gain additional profession, occupation of intellectual and developmental character (school programming, digital creativity), development of social and labor orientations, and personal qualities of the future worker. As a result of the study, it can be concluded that the leading factors affecting the socialization and professionalization of students in a vocational school are: socio-economic changes in the country, the development of artificial intelligence, the introduction of the institution of private property, multi-layered economy, commodity markets, and the democratization of society's life, type and professional profile of an educational institution, professionalism of masters and teachers, material and technical equipment of educational institutions.

Keywords Value orientations of youth · Intelligent machines · New economy · Vocational schools

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JEL Codes Y 800

1 Introduction

Processes of socialization and professionalization of the individual in the modern economic system, the digital economy in the age of intelligent machines cause the need to get vocational education and professional career. In these conditions, the social and professional role of education in the socio-economic development of society is sharply relevant.

Socialization is a process of personality formation, the formation of personal experience, the acquisition and development of means that enable the individual to represent himself as a subject of labor activity. Professionalization becomes a new characteristic of working life. It should be borne in mind that the "new economy with intelligent machines" will require new knowledge, skills, professional competencies of workers and specialists in connection with the new organization of labor and the use of artificial intelligence.

Conducted sociological studies revealed acute problems of students in determining their fate, finding a life path that will maximize the abilities and capabilities of future specialists. At the same time, the choice of a profession, educational institution, type of professional activity to a large extent forms the way of subsequent life. The problems of the social and professional formation of a person are confronted. First of all, with the choice of a person's life path, the manifestation of activity in the life of young people, and mastering several professions in connection with conjunctural demands of the labor market. Processes of socialization and professionalization of the individual are complicated by the following factors: the uncertainty of employment by profession; difficulties in material and financial support in the family.

In this regard, the purpose of this article is a sociological study of the role of value orientations of young people, the social and professional development of future workers and specialists, and the role of professional educational institutions in determining the life path, when choosing future professions in the era of intelligent machines.

2 Materials and Method

In sociological, pedagogical, and economic studies, methods of collecting opinions and opinions of students are widely used. These methods include questioning, interviewing and conversation. In the direct socio-pedagogical interaction of the researcher and the respondent, interviews and conversations are used, and in the indirect interaction, questionnaires are used. When using these methods, both motivations and results of students' activity are recorded, their opinion and the obtained data are

quantitatively processed (Lapshova 2019; Markova et al. 2017, 2018; Markova and Tsyplakova 2017; Vaganova and Lapshova 2019).

When using these methods, three stages are distinguished: preparatory, which includes the development of questionnaire and aerobatics; gathering information during an oral or written survey of a certain group of people; processing and summarizing received information.

Questionnaires are often used to study the professional orientation, sustainability of graduates, their social activity. The questionnaires reflect issues related to the choice of profession, interest in employment; difficulties that students experienced in the learning process, the attitude towards production activities, and public life. A questionnaire reveals the student's personal opinion about their successes in work, about the difficulties they met, their attitude to work, comrades, level of upbringing, independence, etc. (Ilyashenko et al. 2018).

The interview is used to identify the student's attitude to various pedagogical and industrial phenomena. When using interviews with opinions, the motives of actions, and the choice of educational institutions, or professions are clarified.

The literature review showed a high degree of knowledge of the problem posed, which was touched upon in the works of Ilyashenko et al. (2019), Smirnova et al. (2018), Vaganova and Lapshova (2019) and Watts (2020a, b).

3 Results

In the conditions of the modern economic system, the digital economy and the era of intelligent machines, the task of training future workers and specialists with a high level of qualification, competitiveness of the employee in the labor market is coming to the fore (Markova et al. 2019).

The choice of the future path of life is associated with the formation of social, labor, and professional values of youth. Formed professional competencies become important for graduates of professional educational institutions. Social-labor and vocational orientations shifted to the pragmatic side. Having mastered two, three related professions, students will feel more socially protected in their future life. Already 70% of students surveyed would like to receive several additional, related professions during their studies (Markova et al. 2019; Myalkina 2011).

As the study showed, the main task of providing employment for graduates is their training in integrative professions, in addition to practical actions, students can get a system of theoretical knowledge that will help them in the future to navigate the surrounding reality (for example, in commercial and entrepreneurial activity).

As you know, 4–6% of the working age population have a propensity for entrepreneurial activity (Markova et al. 2019). So, only a small part of young people will become businessmen in the future.

The working population can be divided into three categories:

- market asset—4–6% of entrepreneurs, businessmen, farmers, who are actively manifesting themselves in the conditions of post-industrial production;
- mass market—the bulk of those engaged in professional activities under labor contracts;
- market liabilities—unemployed citizens (migrants, demobilized military personnel, etc.).

So, among graduates of professional educational institutions, 3.5% are entrepreneurs; 91.3% are employees; 5.2% are unemployed.

It was revealed that graduates of professional educational institutions are the most energetic and enterprising employees. There are all educational groups, they make up the largest proportion of workers in the enterprises of the "new economy";

Enterprises of the "new economy" employ graduates who have graduated from professional educational institutions 28.1%; higher education institutions—17.2%.

Among those who graduated from vocational schools, the most significant share of energetic people who found additional income:

- graduated from vocational schools: 43.8%;
- graduated from higher education institutions: 36.2%;
- graduated from secondary schools: 34.8%.

In economic success, students who graduate from professional educational institutions are significantly ahead of other educational qualifications. The economic success of graduates of professional educational institutions can be explained by the fact that the process of their socialization with the introduction of new curricula, the intensification of pedagogical activity of teachers was expressed in the formation of the personality of future workers (Fedorov et al. 2017a, b; Gruzdeva et al. 2018; Ilyashenko et al. 2018).

In the process of training, their level of theoretical and practical training increases, which allows them to competently navigate in the modern economic system and the socio-political situation in the country. For future employment, mastery of digital technologies is considered mandatory by 85%, the training of digital personnel for managing business activities is becoming relevant.

Social research has shown that graduates of vocational schools are characterized by political indifference (Markova et al. 2018).

The share of graduates who want to start their own business is quite significant (27.8%), the proportion of graduates who graduated from higher education institutions (31.1%), the proportion of graduates who graduated from secondary schools (21.8).

The proportion of graduates wishing to leave for modern jobs abroad is:

- graduated from higher education institutions: 9.6%;
- graduated from vocational schools: 9.3%;
- graduated from secondary schools: 6.7%.

One of the indicators of economic development of the country is the differentiation of society by level of well-being (Markova et al. 2019).

Stratification of society—is quite positive (27.5% of respondents say); objectively necessary for economic progress (30% of respondents); against inequality (10% of respondents). Nearly three-quarters of all those surveyed approve of the idea of private property, a multi-layered and digital economy. This means that students have certain attitudes and psychological readiness to include in the new system of relations high-tech segments of industry markets.

Already in the learning process, young people enter the market and are actively work in new business.

So, 40–50% of young people already work during school.

One of the stages of socialization is the employment of graduates of professional educational institutions.

So, 38% of graduates were employed in the specialty. For various reasons (military service, continuing education, family problems), 29% did not find a job, and 11% of graduates did not triple their profession. Undecided, but in need of work was 22% of graduates.

Freshmen and graduates expect to get a profession related to joint and private enterprises, work abroad, own business in the conditions of modern economic systems. We would like to work in a joint venture 9% of first-year students and 17% of graduates of vocational schools. 28% of freshmen would like to go for temporary work abroad, and 14%—for permanent work. Among graduates, these figures are 14% and 6%, respectively (Smirnova et al. 2018), 41% of graduates would like to start their own business, but only 2.2% have their own business, generating income. Often the reasons for this are the lack of necessary knowledge, financial resources, and fear of risk.

Students are interested in entrepreneurial experience 6%. Only 0.5% of graduates took this experience. Those who is wishing to receive an additional profession are 22% of freshmen. Among graduates, only 13% were able to do this.

A high degree of socialization is determined by high professional potential (10–15% of students), which constitute the creative core of workers; honest quality attitude to work (40% of students).

Leisure activities play a big role in the socialization of the individual. The structure of leisure forms of activity forms a diverse range of developed, socially, and morally stable people (Semarkhanova et al. 2018).

For freshmen, the priority forms of leisure are clubbing, chatting with friends, watching TV shows, and videos.

A positive trend should be considered that as they grow older, young people pay more attention to intellectually and aesthetically developing activities than at school.

Some graduates are engaged in the visual arts, more often attend programming schools, exhibitions, theaters, show interest in digital art, and participate in the creation and use of artificial intelligence.

However, the total percentage of people engaged in developing activities is low, which indicates the need to improve the structure of youth leisure. This is preparing young people for new types of socio-economic relations associated with autonomous machine communications.

The social and professional values that have been formed among students during their studies in vocational schools are also important characteristics of the socialization and professionalization of young workers or specialists (Markova et al. 2017).

Attention should be paid to the quality of personality that is significant for a person. As they grow older and gain experience, young people "refine" the portrait of their authority in life. Graduates are distinguished from freshmen by their orientation to such qualities as high culture and morality, professionalism, mobility, and the desire for self-development. For first-year students, the main authorities are parents and relatives (57% of respondents). Graduates are characterized by other levels of self-awareness. Most of them (51%) would like to be like themselves, creating an individual "I am position".

Social values are also important as criteria goals. Many students have significant qualities such as hard work, perseverance, creativity, initiative (Markova et al. 2017).

The social and labor orientations of students in vocational educational institutions determine the following forms of social behavior. These include:

- students are focused on working professions (15%);
- students are focused on working with intelligent systems (30%);
- students are focused on continuing education (18%);
- students are focused on creating their own business (30%);
- choice of employment in government, joint-stock, joint ventures, private enterprises (32%);
- choosing a job in foreign campaigns (25%);
- obtaining additional prospects related to the commercial and entrepreneurial activity of competencies (19%).

It should be noted that in the era of intelligent machines in professional educational institutions there is a positive process of becoming young professionals. A stable core of future workers is being formed, which can become carriers of the best qualities of socially mature professionals, setting the vector of a positive charge in their immediate environment.

The study showed that the number of supporters of the introduction of economic and legal institutions of private property was 85%.

The structure of independent activity of students is dynamically changing: if previously dominated the types of productive labor performed in professional educational institutions, but now the modern conditions dominated by labor in modern market structures, with "smart" automation. In this case, the process of socialization of students goes through their work, and the entire pedagogical complex is connected with the course of transformation of ownership forms. Students who, during their studies, have effectively entered the modern economic space, are more competitive in the labor market, and stand out from their less active fellows. These phenomena affect the choice of the first profession for socio-economic reasons. The share of graduates who have changed their attitude to the profession in a positive direction has increased.

It was determined that the socio-pedagogical factors that impede the successful development of the profession are the poor material and technical base of educational institutions, the insufficient preparedness of teachers and masters of industrial training. Many of them do not own modern pedagogical technologies (Vaganova and Lapshova 2019).

Along with the traditional personal qualities necessary for successful work (hard work, responsibility, discipline, honesty, commitment, diligence, perseverance, etc.), students increasingly name in their answers a range of modern communicative qualities necessary for job search and real employment (sociability, talkativeness, politeness, attentiveness, sincerity, humor, correctness, etc.—38% of the respondents). A significant proportion of students (29%) believe that personal qualities such as perseverance, courage, activity, persistence, breakdown strength, arrogance. So, adventurism will surely help and have already helped some students today.

All considered new labor and social-professional attitudes testify to the priority orientation of modern youth to a high level of well-being and personal welfare. If earlier such orientations among their peers were still not sufficiently conscious and supported only by the external attributes of welfare: bank account, car, cottage, luxurious things but now young people understand that this is not enough for real well-being. Firstly, financial certainty is needed. This is the right choice of a guaranteed source of income, place of work, profession, specialty, and labor. Secondly, financial security. Accumulation and the availability of money and things—not as an end in itself but as an opportunity to look calmly into the future, with confidence in the welfare of tomorrow.

Thirdly, financial independence. The presence of a high level of education, knowledge of several modern professions, knowledge of foreign languages make a person independent of a single source of income, give him the opportunity to replace this source, find a job in another company, or leave to work in another country, etc. These indicators of the level of real well-being of a person (we abstract from indicators of mental and physical health, etc.) suggest a certain strategy of social and professional behavior.

4 Conclusion

Based on the study, we can conclude that the leading factors affecting the socialization and professionalization of students in a vocational school are: socio-economic changes in the country, the development of artificial intelligence, the introduction of the institution of private property, a multi-layered economy, commodity markets and mass, the democratization of society's life, type and professional profile of the educational institution, professionalism of masters and teachers, material and technical equipment of the educational process, organization of production practical practice, forms of competition and creativity, social infrastructure, family (structure and role functions), standard of living, gender, age, and education.

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Sharing Economy as a New Form of Consumer Cooperation in the Digital Age

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Abstract The paper aims to study the sharing economy as a new form of consumer cooperation in the conditions of digitalization from the perspective of its contribution to the welfare of society and the prospects of management in various economic systems. In order to determine the effects of the sharing economy on social well-being, the authors analyzed its effect on the happiness index using regression and correlation analysis. To establish the factors of development of the sharing economy, the authors determined its regression dependence on the level of education, availability and active use of ICTs, and informatization of society. The prospects for developing the sharing economy are identified by the simplex method based on the obtained regression models. The paper shows that in modern economic systems, the impact of the sharing economy on social welfare is highly differentiated—from clearly negative to steadily positive. In the low 10 countries on the level of sharing economy, its development contributes to increasing the population's happiness. Therefore, the recommendations for the development of the sharing economy are formulated. In the top 10 countries on the level of the sharing economy, its further development is impractical because it reduces the level of happiness in society. The results demonstrated the ambiguity of the sharing economy as a new form of consumer cooperation in the context of digitalization and the need for its flexible regulation in each particular economic system.

Keywords Sharing economy · Consumer cooperation · Digitalization · Public welfare · Population happiness · Public administration

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1 Introduction

The sharing economy is a new form of consumer cooperation in the context of digitalization. Before the formation of the digital economy, consumer cooperation involved (1) the sharing of public goods through the creation of consumer cooperatives (first form) through the payment of share fees, (2) rental relationships combined with second-hand shops (second form), or (3) the free/refundable transfer of suitable goods for their reuse in a narrow social environment (through acquaintances) (third form).

With the help of the Internet, special platforms, and applications, it has become possible to distribute goods for reuse without reference to geographical (through electronic payment for goods and "smart logistics") and social (without the constraints of the circle of acquaintances) boundaries. Thus, there emerged a fourth form of consumer cooperation. Despite its ubiquitous availability in the context of digitalization, the sharing economy is an ambiguous phenomenon for the economy (at the macro-level of the economic system) and society (at the micro-level of the subjects of sharing).

The positive effect of the sharing economy on an economic system lies in the possibility of saving resources to produce reusable goods. This is especially valuable in terms of reducing the consumption of natural resources and protecting the environment. The benefits for sharing entities are associated with the increased availability of goods and overcoming scarcity, that is, meeting the current needs at a lower cost. The involvement in responsible consumption (by contributing to the conservation of natural resources) can provide an additional non-material incentive for sharing.

Simultaneously, the negative consequences of the sharing economy for the economic system are related to the reduction in tax revenues to the state budget since sharing is either not taxed or is carried out in the sphere of the shadow economy. More significant is the opportunity cost of sharing goods, the production and distribution of which in business (without sharing with the creation of new goods) would create additional jobs and increase tax revenues for the state budget.

Subjects of sharing, in turn, do not always prefer to use old goods but rather seek out new products. That is, in the case of the sharing economy, needs are often not fully met, and the value of responsible consumption is not shared by everyone. The sharing economy can act as a compulsory measure for low-income populations to obtain the goods they require. Due to the contradictory nature of the sharing economy, state management of its development must be based on a clear idea of its role in society.

This paper hypothesizes that the sharing economy has different meanings in different societies. Therefore, it needs to be managed flexibly, with a rejection of universal regulatory practices. The purpose of this study is to study the sharing economy as a new form of consumer cooperation in the conditions of digitalization

from the perspective of its contribution to the welfare of society and the prospects of management in various economic systems.

2 Literature Review

The sharing economy as a special form of consumer cooperation is considered in many works (Akopova et al. 2020; Alpidovskaya et al. 2019; Bogoviz et al. 2019a, b; Cheng 2020). Many prominent scholars study digitalization as a socio-economic environment conducive to the development of sharing (Dangi and Narula 2020; Huang and Kuo 2020; Jia et al. 2020; Khan et al. 2020; Maalouf et al. 2020; Matharu et al. 2020; Popkova and Haabazoka 2019; Popkova and Sergi 2020; Wang et al. 2020).

The literature review has shown that the importance of digitalization and the Internet for developing the sharing economy is recognized and emphasized in the secondary literature. Nevertheless, these studies do not fully reveal the impact of the sharing economy on public welfare and the prospects for managing its development, which is still spontaneous. The authors conducted this research in order to fill the identified gaps.

3 Materials and Methods

In order to test the hypothesis and identify differences between economic systems, the sample of countries in this research is heterogeneous. It includes countries from two categories: top 10 countries by sharing economy and low 10 countries by sharing economy according to the Consumer Choice Center rankings for 2020 (Consumer Choice Center 2020). To determine the effects of the sharing economy on social well-being, the authors analyzed its effect on the happiness index calculated by Helliwell et al. (2020) using regression and correlation analysis.

To establish the factors of development of the sharing economy, the authors determined its regression dependence (sharing economy index) on the level of education (2.1 Education), access (3.1.1 ICT access) and active use (3.2.1 ICT use) of information and communication technologies (ICT), and on the level of informatization of society (3.1.4 E-participation). The prospects of developing the sharing economy are revealed by the simplex method based on the previously obtained regression models. The statistical basis for the study is summarized in Table 1.

Table 1 Sharing economy as a new form of consumer cooperation in the context of digitalization: the level of development, factors, and implications in 2020

Category	Country	Sharing economy index, points 1–100	Level of education, points 1–100	ICT accessibility, points 1–100	ICT use, points 1–100	Level of informatization of society, points 1–100	Population happiness index, points 1–10
Top 10 countries in terms of sharing economy	Estonia	100	54.6	81.2	81.6	91.0	6.022
	Russia	95	51.9	72.8	68.3	92.1	5.546
	Georgia	90	47.0	70.4	57.1	62.4	4.673
	Belgium	85	75.4	80.2	76.6	75.8	6.864
	Spain	80	50.8	81.3	79.6	98.3	6.401
Low 10 countries in terms of sharing economy	Turkey	70	67.4	65.8	88.9	86.0	5.132
	Canada	65	54.1	79.6	77.4	91.0	7.232
	Bulgaria	60	43.5	71.3	69.9	87.1	5.102
	Japan	55	48.6	85.6	81.9	98.3	5.871
	Greece	40	53.7	80.6	72.4	87.6	5.515

Source Compiled by the authors based on Consumer Choice Center (2020), Helliwell et al. (2020), WIPO (2020)

4 Results

In order to identify the effects of the sharing economy on social well-being, we turn to the results of regression and correlation analysis of its relationship with the happiness index (Fig. 1).

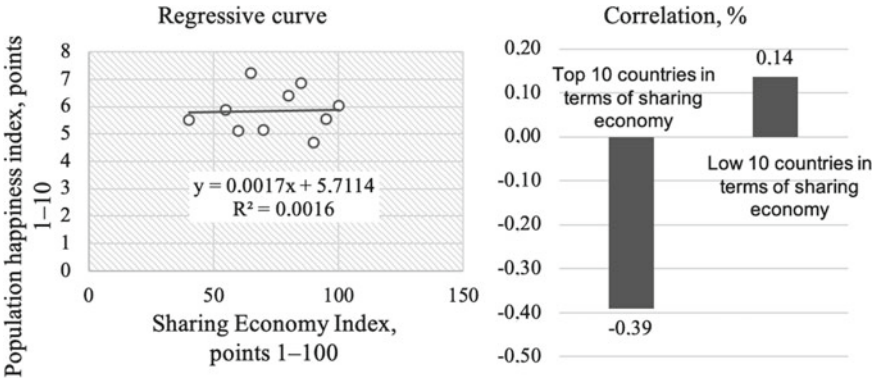

Fig. 1 Regression and correlation analysis of the relationship between the sharing economy and the happiness index in 2020. *Source* Compiled by the authors

Figure 1 shows that the impact of the sharing economy on public welfare is generally positive (as indicated by the positive value of the regression coefficient—0.0017), but weak or inconsistent (as indicated by the near-zero correlation—0.16%). In the total sample of countries, the happiness index increases by 0.0017 points when the development of the shared economy rises by one point.

A more detailed analysis using the method of correlation analysis revealed a fundamental difference between economic systems. In the top 10 countries on the level of sharing economy, it prevents the achievement of happiness in society (i.e., carried out involuntarily). Since this category includes rather developed (e.g., Spain) and rapidly developing countries (e.g., Russia), the pattern can be explained in three ways:

- With the COVID-19 pandemic and crisis, even the developed and rapidly developing countries saw a dramatic fall in living standards; the poverty has reached such a large scale that it has prompted the popularization of the sharing economy;
- The progress of the sharing economy is driven by public pressures (e.g., demands for responsible consumption) to the detriment of the private and commercial interests of households;
- When the sharing economy reaches a high level of development, it obtains the opposite effect on social well-being, reducing happiness in society.

In the low 10 countries, the sharing economy contributes to the achievement of happiness in society; that is, it is carried out in the interests of social well-being. In these economic systems, it is advisable to develop the sharing economy further. In order to identify the conditions for its achievement, we conduct a factor analysis (Fig. 2).

According to Fig. 2, a one-point increase in educational attainment provides a 0.66-point increase in the sharing economy. A one-point increase in the level of

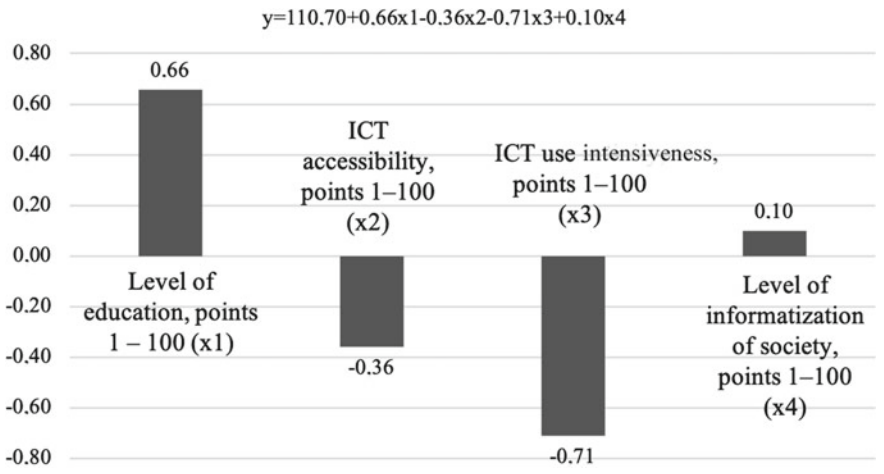

Fig. 2 Factor analysis of the sharing economy in 2020. *Source* Compiled by the authors

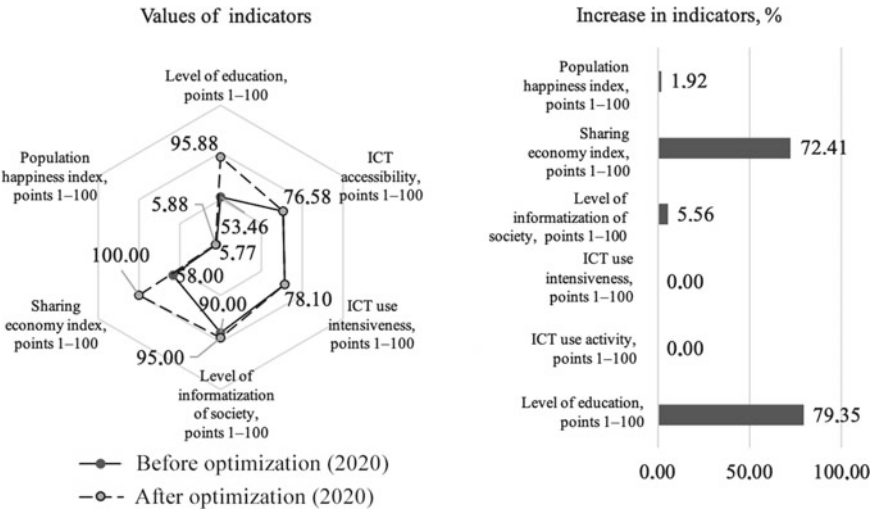

Fig. 3 Prospects for the progress of the sharing economy in the low 10 countries according to its development level. *Source* Compiled by the authors

informatization of society provides 0.10-point progress in the sharing economy. Infrastructural factors, such as the availability and active use of ICT, do not need to be targeted because they do not contribute to developing the sharing economy. This is due to the fact that the level of digitalization of the modern economy is so high that it is sufficient for the sharing economy and has ceased to influence its progress.

Using the regression equation from Fig. 2, we determine the prospects for the progress of the sharing economy in the low 10 countries by level of its development (Fig. 3).

According to Fig. 3, with the highest level of development of the shared economy (100 points) in the low 10 countries in terms of its development, the happiness index of the population reaches the level of the top 10 countries in terms of the sharing economy (5.90 points), increasing by 1.92% to 5.88 points. This requires a 79.35% increase in the level of education to 95.88 points, as well as a 5.56% increase in the level of informatization of society to 95.00 points.

5 Conclusion

We can conclude that the hypothesis put forward turned out to be correct. In modern economic systems, the impact of the sharing economy on social welfare is highly differentiated—from clearly negative to steadily positive. In the low 10 countries on the level of sharing economy, its development contributes to increasing the happiness

of the population. Therefore, the recommendations for the development of the sharing economy are formulated.

In the top 10 countries on the level of sharing economy, its further development is impractical because it reduces the level of happiness in society. The obtained results demonstrate the ambiguity of the sharing economy as a new form of consumer cooperation in the context of digitalization and the need for its flexible regulation in each particular economic system.

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"Smart Cooperation": Prospects for Optimizing Decision-Making in Business Cooperation via Artificial Intelligence

Vladimir S. Osipov, Lilia V. Matraeva, Alexander N. Alekseev, Svetlana V. Lobova, and Tatyana P. Baranovskaya

Abstract In this study, we aim to outline the perspectives of the "smart cooperation" concept for optimizing decision-making in business cooperation. To prove that the efficiency of cooperation processes in modern enterprises is limited (moderate), we calculated the correlation between the level of inter-enterprise clustering cooperation and the indicators of the ease of doing business. We sampled several groups of five countries with different levels of digital competitiveness (according to 2020 data). We proved that the efficiency of business cooperation is currently limited (average correlation with the ease of doing business indicators—58.28%). However, it can be increased by using artificial intelligence (average correlation with the ease of doing business indicators—53.84%). For this purpose, we developed the "smart cooperation" concept that would optimize decision-making in business cooperation via artificial intelligence. Within this concept, artificial intelligence allows evaluating the current performance of the enterprise, determining the feasibility and efficiency of various cooperation options, predicting the performance of the enterprise under various cooperation options, and providing smart support for choosing or changing options, as well as terminating cooperation altogether.

Keywords "Smart cooperation" · Optimization · Decision-making · Business cooperation · Big data · Artificial intelligence

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1 Introduction

Cooperation between enterprises usually has the objective of increasing efficiency. Successful cooperative alliances provide such benefits as: improved access to resources, more favorable terms of trade, and stronger position with regard to representing and defending their interests in the interaction with the government regulators. However, the numerous examples of unsuccessful cooperation demonstrate that these benefits cannot be guaranteed. Moreover, cooperation may have some disadvantages, such as decreased flexibility, limited ability to choose resource suppliers and terms of trade, and decreased efficiency.

Decision-making in business cooperation is an arduous task since an enterprise is influenced by a number of factors, has several cooperation options, and different (sometimes even conflicting) priorities of cooperation. Moreover, these factors, options, and priorities are rapidly changing. Therefore, making informed and timely decisions regarding business cooperation requires solving complex optimization problems in real time. Management is often unable to accomplish this task due to limited managerial and analytical resources in small and medium-sized enterprises and because of the "human factor" in large enterprises.

Artificial intelligence (AI) as a way to optimize decision-making is increasingly being used and researched in economics and entrepreneurship. AI is becoming massively available, including for small and medium-sized enterprises. It allows overcoming the "human factor" in decision-making. We present the following working hypothesis: the effectiveness of cooperation processes of modern enterprises is limited and can be improved by the use of artificial intelligence. This study aims to outline the prospects of using the "smart cooperation" concept to optimize cooperation decision-making with the use of AI. Moreover, the study presents a scientifically substantiated model of "smart cooperation".

2 Literature Review

Mechanisms, options, and specific features of business cooperation were studied in the works of several Russian and foreign scholars (Alekseev et al. 2020; Arranz et al. 2019; Bogoviz 2020; Bogoviz et al. 2020; Brache 2018). Various issues of applying "smart" technologies to optimize decision-making in entrepreneurship were discussed in numerous scholarly studies (Makar et al. 2019; Montshiwa 2018; Popkova et al. 2021a, b; Tsikin et al. 2019; Xue et al. 2018).

The literature review proved that the essence of decision-making in the field of cooperation of enterprises is not sufficiently studied in existing publications, while the prospects for optimizing decision-making in cooperation via AI are only vaguely

understood. The "smart cooperation" concept, developed in this study, aims to fill these research gaps.

3 Materials and Methods

We tested the working hypothesis via the correlation analysis method. To prove that the efficiency of cooperation processes in modern enterprises is limited (moderate), we calculated the correlation between the state of cluster development (World Economic Forum 2019) and each indicator of the ease of doing business index (World Bank 2021). Limited efficiency would correspond to the average correlation of less than 80%.

To prove the prospects of using Big Data and AI in enterprises, we calculated the correlation of the use of big data and analytics index (IMD 2020) and each indicator of the ease of doing business index. The prospects were considered significant if the average correlation was more than 50%. The study sample consisted of countries that differ by the digital competitiveness rating (three groups with five countries each). The data on digital competitiveness and ease of doing business indices of the sampled countries is presented in Fig. 1.

The statistics on the state of cluster development and the usage of Big Data and AI at the enterprises of the sampled countries are presented in Table 1.

Ease of doing business indicators in sampled countries are presented in Table 2.

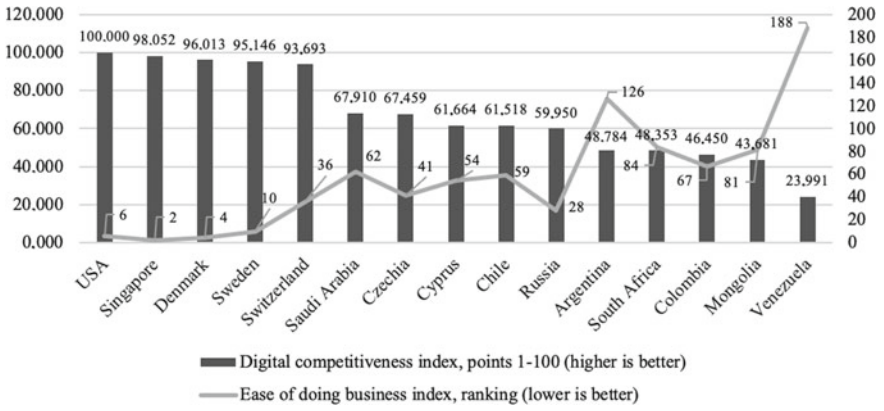

Fig. 1 Digital competitiveness and ease of doing business indices in sampled countries, according to 2020 data. *Source* Compiled by the authors based on IMD (2020), World Economic Forum (2019)

Table 1 State of cluster development and the usage of Big Data and AI at the enterprises of the sampled countries, according to 2020 data

Competitiveness ranking group	Country		State of cluster development, points 1–100	Use of Big Data and analytics, ranking 1–63
Leading countries (High)	USA	USA	74.8	9
	Singapore	SGP	69.2	10
	Denmark	DNK	67.1	12
	Sweden	SWE	64.8	7
	Switzerland	CHE	71.9	25
Countries from the middle of the list (Medium)	Saudi Arabia	SAU	66.1	24
	Czechia	CZE	46.8	27
	Cyprus	CYP	48.2	50
	Chile	CHL	45.6	56
	Russia	RUS	40.3	33
Countries from the bottom of the list (Low)	Argentina	ARG	40.8	49
	South Africa	ZAF	55.1	44
	Colombia	COL	43.2	41
	Mongolia	MNG	33.7	53
	Venezuela	VEN	25.9	45

Source Compiled by the authors based on IMD (2020), World Economic Forum (2019)

4 Results

To define the prospects of optimizing decision-making in cooperation via AI, we compared the correlation of the ease of doing business indices with the usage of Big Data and AI and clustering cooperation state in the sampled countries (Fig. 2).

Figure 2 demonstrates that all the ease of doing business indices increase in direct proportion with clustering cooperation (avg. correlation of 58.28%) and the usage of Big Data and AI (avg. correlation of 53.84%). This means that the effectiveness of business cooperation is limited but can be improved using AI. We propose the concept of "smart cooperation" that would optimize decision-making in cooperation via the use of AI (Fig. 3).

The concept in Fig. 3 demonstrates that AI can:

- Evaluate the current performance of the enterprise—determining the baseline parameters prior to cooperation, taking into account different factors affecting the company (input by the management);
- Determine the feasibility and efficiency of various cooperation options according to the criteria set by the management;
- Predict the efficiency of the enterprise in different scenarios of cooperation options;

Table 2 Ease of doing business indicators in sampled countries (presented by ISO 3166 codes), according to 2020 data, ranking in the world (lower is better)

	High competitiveness					Medium competitiveness					Low competitiveness				
	USA	SGP	DNK	SWE	CHE	SAU	CZE	CYP	CHL	RUS	ARG	ZAF	COL	MNG	VEN
Starting a business	55	4	45	39	81	38	134	50	57	40	141	139	95	100	190
Dealing with construction permits	24	5	4	31	71	28	157	125	41	26	155	98	89	29	175
Getting electricity	64	19	21	10	13	18	11	75	39	7	111	114	82	152	174
Registering property	39	21	11	9	18	19	32	71	63	12	123	108	62	50	145
Getting credit	4	37	48	80	67	80	48	80	94	25	104	80	11	25	132
Protecting minority investors	36	3	28	28	105	3	61	21	51	72	61	13	13	25	170
Paying taxes	25	7	8	31	20	57	53	29	86	58	170	54	148	71	189
Trading across borders	39	47	1	18	26	86	1	50	73	99	119	145	133	143	188
Enforcing contracts	17	1	14	39	57	51	103	142	54	21	97	102	177	75	150
Resolving insolvency	2	27	6	17	49	168	16	31	53	57	111	68	32	150	165

Source Compiled by the authors based on World Bank (2021)

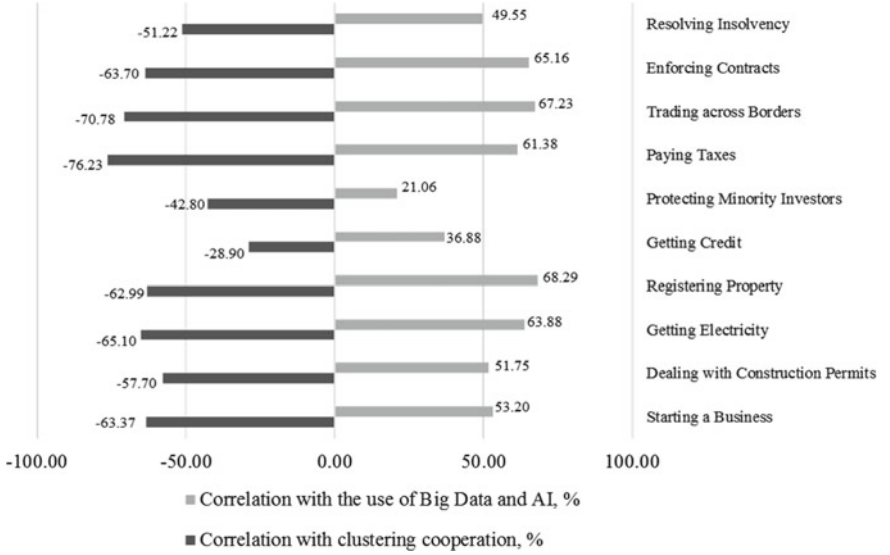

Fig. 2 Correlation of the ease of doing business indices with the usage of Big Data and AI and clustering cooperation state in countries with different digital competitiveness, according to 2020 data, %. *Source* Compiled by the authors

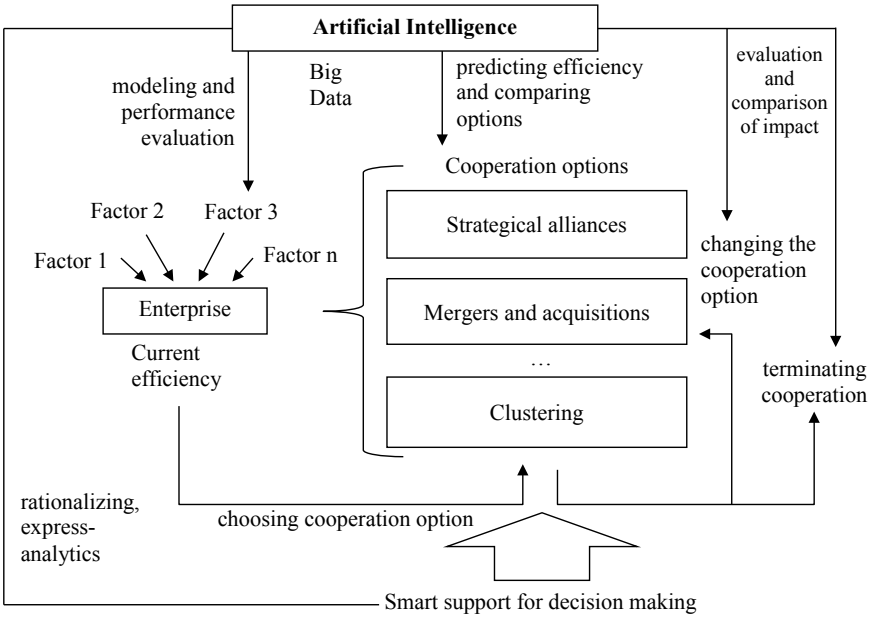

Fig. 3 "Smart cooperation" concept for optimizing decision-making in business cooperation via AI. *Source* Compiled by the authors

- Provide smart support for making decisions on choosing or changing the cooperation option, as well as terminating cooperation altogether.

5 Conclusion

We proved the working hypothesis and confirmed that the current efficiency of business cooperation is limited (avg. correlation with the ease of doing business indicators: 58.28%) (the value of the correlation coefficient was negative to emphasize the positive relation of the two indices, despite the difference between their scales—one index improved at lesser values, the other at greater values), but can be improved by introducing AI (correlation with the ease of doing business indicators: 53.84%). For this purpose, we developed the "smart cooperation" concept that would be used to optimize decision-making in business cooperation via AI technologies.

The ongoing COVID-19 crisis increased the risks for business cooperation, thereby increasing the complexity and gravity of making cooperation-related decisions. The proposed concept of "smart cooperation" with the use of AI technologies could minimize the risks of business cooperation and ensure the stability of businesses in times of crisis. This fact increases the demand for such a concept in international practice.

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Digital Cooperation as a Promising Way to Improve the Financial Results of Enterprises

Alsu R. Nabiyeva, Larisa I. Kuzmina, Elena M. Kryukova, Valeriya Sh. Khetagurova, and Alfira M. Kumratova

Abstract The paper argues that digital cooperation is a promising way to improve the financial results of enterprises and to develop recommendations for crisis management of enterprises in the Russian regions in 2021 to obtain the profits lost in 2020. To reflect and consider the difference between regions with different levels and rates of socio-economic development, this study is conducted on the samples of four types of regions created based on the statistics of digitalization, cooperation, and financial results of enterprises in 2020. In regions of each type, the study finds a regression dependence of the balanced financial performance of enterprises on the level of digitalization and the number of business clusters (as an indicator of the level of cooperation in entrepreneurship). Thus, the paper confirms the hypothesis that the profits lost in 2020 (business losses due to the pandemic) can be extracted in all Russian regions through the development of digital cooperation, which allows to define it as a promising way to improve the financial results of enterprises. For this purpose, the authors propose applied recommendations for regions with profound differences.

Keywords Digital cooperation · Financial results · Enterprises · Pandemic · COVID-19 crisis · Regions of the Russian Federation

JEL Codes C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

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1 Introduction

In a pandemic, businesses worldwide suffered large-scale losses, which proved critical in many cases. These losses were caused by severe restrictions imposed by governments, a reduction in demand, the collapse of value chains, and the collapse of most markets due to the COVID-19 crisis (Popkova et al. 2021). At the macroeconomic and global level, the damage of the crisis in 2020 is yet to be calculated. Nevertheless, at the level of regional economies within countries, some first results and statistics allow us to study the effects of the pandemic and crisis on entrepreneurship from a scientific point of view. The experience of large countries with marked differences among regions, such as Russia, is most valuable because it provides the most accurate and informative results.

The search for anti-crisis mechanisms and ways to improve the financial results of enterprises is highly relevant. The total restrictions on economic activity imposed by the pandemic have undermined most cooperative initiatives and entrepreneurial ties. This does not allow for the usual cooperation opportunities, which are often successfully implemented in crisis management in enterprises. However, the experience of various areas of the economy in 2020 has shown that the transition to digital cooperation allows one to maintain business activity sufficiently.

This is the basis for the hypothesis that the use of digitalization opportunities for the development of the cooperative sector of the economy can improve the financial performance of enterprises in the current COVID-19 crisis and earn the profits lost in 2020. The paper aims to argue that digital cooperation is a promising way of improving the financial results of enterprises. Moreover, the paper develops recommendations for crisis management of enterprises in the Russian regions in 2021 to extract the profits lost in 2020.

2 Literature Review

The contribution of cooperation in improving the financial results of enterprises is reflected in Agyabeng-Mensah et al. (2020), Arranz et al. (2019), Galvão et al. (2019), Pereira et al. (2020), Popkova and Sergi (2020). The advantages of the digital economy and its opportunities to improve the financial results of enterprises are disclosed in the works of Bogoviz (2020), Bogoviz et al. (2019), Chaldaeva (2019), Inshakova et al. (2020), Popkova et al. (2021).

At the same time, the literature review revealed insufficient elaboration of the concept and insufficient study of the practical experience of digital cooperation. Therefore, there remains uncertainty about its potential and actual contribution to improving the financial results of enterprises. This research aims to fill this gap and study digital cooperation as a promising way to improve the financial results of enterprises on the example of the Russian regions.

3 Materials and Methods

The digital form of business cooperation in modern Russia is in the process of formation and institutionalization. Therefore, there are no statistics on it—the data on digitalization and cooperation (its predominant form is clustering) are available separately. At the same time, there are known directions of using digital technologies that allow cooperation (Fig. 1).

According to Fig. 1, Russian enterprises actively use digital technologies to enable cooperation. Thus, 58.10% of Russian enterprises carry out the financial calculations in electronic form; the e-signature software is used by 73.40% of enterprises; 57.20% of enterprises solve organizational, managerial, and economic problems in electronic form. This emphasizes the appropriateness of conducting a case study on the example of Russia.

To reflect and consider the differences between regions with different levels and rates of socio-economic development, this study is conducted based on the samples of four types of regions according to the classification of the Institute of Scientific Communications (2021). The statistics of digitalization, cooperation, and financial results of enterprises in the Russian regions of each type in 2020 are shown in Tables 1, 2, 3 and 4.

The study finds the regression dependence of the balanced financial performance of enterprises on the level of digitalization and the number of business clusters (as an indicator of the level of cooperation in entrepreneurship) for regions of each type. The economic sense of the hypothesis is that the regression relationships established for all regions allow finding a combination of digitalization and cooperation, which will allow enterprises in 2021 to obtain the benefits lost in 2020 (to cover the losses from the pandemic).

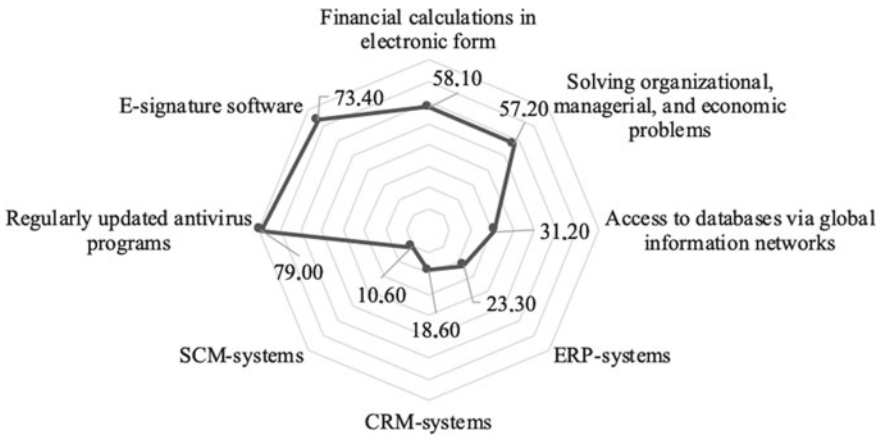

Fig. 1 The share of enterprises implementing the indicated areas of using digital technology allowing for cooperation, %. *Source* Compiled by the authors based on Abdrakhmanova et al. (2021)

Table 1 Statistics on digitalization, cooperation, and financial results of enterprises in the Russian regions with great development potential in 2020

Regions	Balanced financial result of enterprises, mln. RUB	Level of digitalization, points 1–100	Number of business clusters, pcs
Altay Territory	81,314.26	43.22	6
Irkutsk Region	403,763.05	50.06	5
Karachayevo-Chircassian Republic	53.67	28.25	2
Kurgan Region	−435,497.20	27.41	2
Republic of Adygeya	1.63	30.93	0
Republic of Buryatia	8535.05	31.15	0
Republic of Mordovia	−55,347.31	39.82	3
Tula Region	49,639.19	65.67	2

Source Compiled by the authors based on Association for the Development of Clusters and Technology Parks of Russia (2021), Institute of Scientific Communications (2021)

Table 2 Statistics on digitalization, cooperation, and financial results of enterprises in the advanced and fast-growing regions of Russia in 2020

Regions	Balanced financial result of enterprises, mln. RUB	Level of digitalization, points 1–100	Number of business clusters, pcs
Astrakhan Region	53,606.76	51.79	2
Ivanovo Region	1454.80	43.69	1
Kaluga Region	139,939.97	58.69	1
Lipetsk Region	5,272,906.40	63.85	4
Primorye Territory	24,724.72	50.74	0
Republic of Crimea	77,699.64	38.86	0
Smolensk Region	5707.16	9.09	4
Chelyabinsk Region	146,507.59	61.01	3

Source Compiled by the authors based on Association for the Development of Clusters and Technology Parks of Russia (2021), Institute of Scientific Communications (2021)

4 Results

Table 5 shows the regression statistics and financial results of enterprises with digitalization and cooperation in the Russian regions in 2020.

Based on the results of the regression analysis obtained in Table 5, the authors determined the prospects for improving the financial results of enterprises and conducting crisis management based on digital cooperation in Russian regions of different types in 2021 (Figs. 2, 3, 4 and 5). According to Vedomosti, the balanced financial result of enterprises in Russia in 2020 on average decreased by 51.6%

Table 3 Statistics on digitalization, cooperation, and financial results of enterprises in the progressive Russian regions with slow development in 2020

Regions	Balanced financial result of enterprises, mln. RUB	Level of digitalization, points 1–100	Number of business clusters, pcs
Leningrad Region	519,733.25	63.71	13
Moscow Region	592,223.86	66.93	16
Murmansk Region	11,433.99	62.52	0
Republic of Tatarstan	213,309.13	69.32	14
Sakhalin Region	21,347.04	52.09	0
Tyumen Region	1,161,043.16	66.76	0
Khanty-Mansi Autonomous Area—Yugra	11,477,595.48	69.24	2
Yamal-Nenets Autonomous Area	100,181.08	67.36	0

Source Compiled by the authors based on Association for the Development of Clusters and Technology Parks of Russia (2021), Institute of Scientific Communications (2021)

Table 4 Statistics on digitalization, cooperation, and financial results of enterprises in the lagging regions of Russia in 2020

Regions	Balanced financial result of enterprises, mln. RUB	Level of digitalization, points 1–100	Number of business clusters, pcs
Amur Region	52.96	50.18	0
Volgograd Region	6,974,443.26	57.54	3
Kamchatka Territory	29,552.24	45.94	0
Krasnoyarsk Territory	181,670.09	57.24	1
Magadan Region	2425.38	30.32	0
Komi Republic	151,418.61	57.96	0
Tyumen Region without Autonomous Areas	156,194.50	N/A	0
Khabarovsk Territory	45.38	58.85	2

Source Compiled by the authors based on Association for the Development of Clusters and Technology Parks of Russia (2021), Institute of Scientific Communications (2021)

Table 5 Regression statistics and financial results of enterprises with digitalization and cooperation in the Russian regions in 2020

Regression statistics	In the regions with great development potential	In the advanced and fast-growing regions	In the progressive regions with slow development	In the lagging regions
Multiple correlation (r^2), %	56.99	70.67	47.95	79.00
Constant	−347.00	−2894.27	−18,413.66	431.11
Digitization coefficient, bln. RUB	7.25	50.25	327.56	−18.60
Clustering coefficient, bln. RUB	26.71	659.78	−183.25	1784.59

Source Compiled by the authors

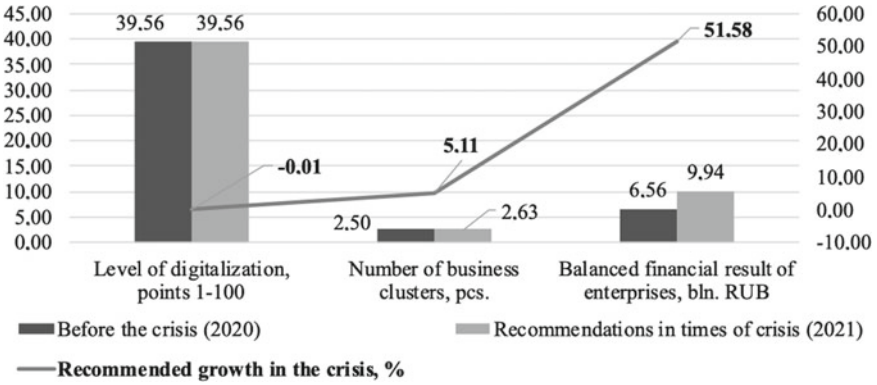

Fig. 2 Prospects for improving the financial results of enterprises and conducting crisis management based on digital cooperation in the Russian regions with great development potential in 2021. *Source* Compiled by the authors

compared to 2019 (Shokhina 2020). Therefore, the goal for the regions of all types is to increase the balanced financial result by 51.6%.

According to Fig. 2, in the Russian regions with great development potential, the increase in the balanced financial result of enterprises by 51.6% (up to 9.94 billion rubles) is achieved with an increase in the number of business clusters by 5.11%.

According to Fig. 3, in the advanced and fast-growing Russian regions, the increase in the balanced financial result of enterprises by 51.6% (up to 9.94 billion rubles) is achieved with an increase in the number of business clusters by 6.38% and with an increase in the level of digitalization by 12.23%.

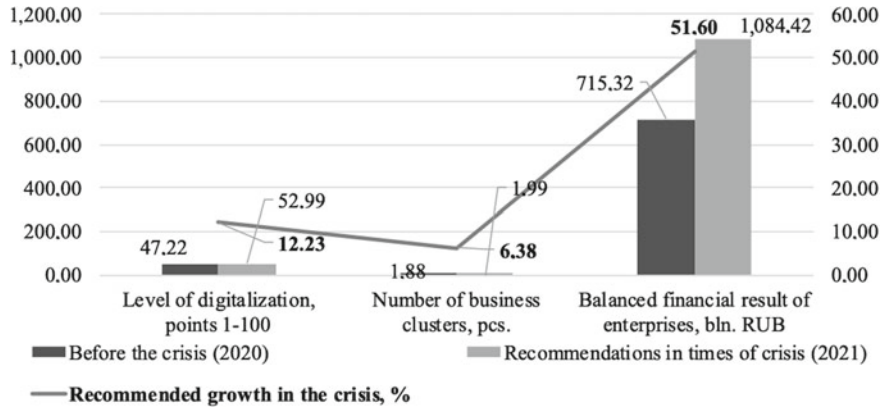

Fig. 3 Prospects for improving the financial results of enterprises and conducting crisis management based on digital cooperation in the advanced and fast-growing Russian regions in 2021. *Source* Compiled by the authors

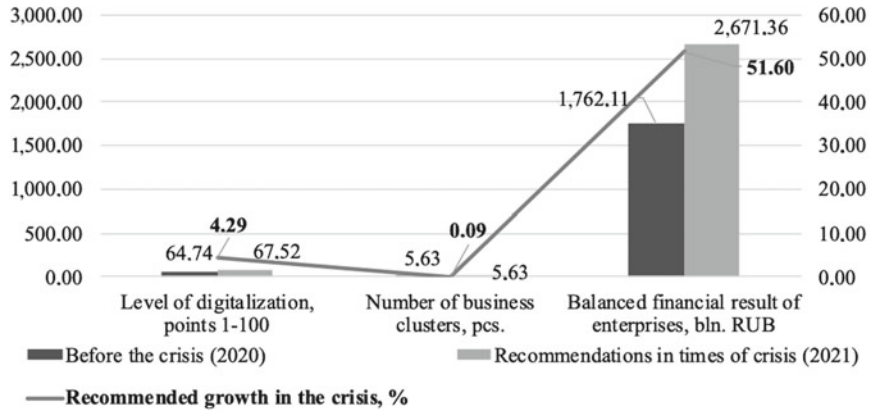

Fig. 4 Prospects for improving the financial results of enterprises and conducting crisis management based on the digital cooperation in the progressive Russian regions with slow development in 2021. *Source* Compiled by the authors

According to Fig. 4, in the progressive Russian regions with slow development, the increase in the balanced financial result of enterprises by 51.6% (up to 9.94 billion rubles) is achieved with an increase in digitization by 4.29%.

According to Fig. 5, in the lagging Russian regions, the increase in the balanced financial result of enterprises by 51.6% (up to 9.94 billion rubles.) is achieved with an increase in the number of business clusters at 36.12%.

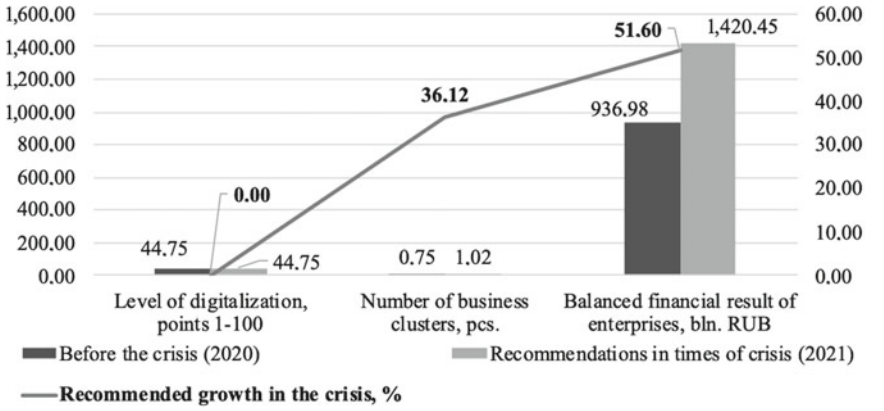

Fig. 5 Prospects for improving the financial results of enterprises and conducting crisis management based on digital cooperation in lagging regions of Russia in 2021. *Source* Compiled by the authors

5 Conclusion

Thus, the authors confirm the hypothesis that all Russian regions can extract the profits lost in 2020 (business losses due to the pandemic) through the development of digital cooperation, which allows to define it as a promising way to improve the financial results of enterprises. For this purpose, the authors offered the applied recommendations for regions of different types, between which profound differences have been identified.

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Development and Regulation of the Digital Economy in the Context of Competitiveness

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Abstract The world economy is currently on the verge of a new transformation. Ongoing digitalization is changing the global economy by reducing the costs of data collection, storage, and processing; reducing production chains, and so on. The increasing processes of digitalization lead to the blurring of geographical and physical boundaries. These circumstances open up new opportunities for states and businesses, and contribute to the development of competitiveness within countries and in the world as a whole. World experience shows that with the proper development of mechanisms for the functioning of the digital economy, including regulatory and legal ones, it is possible to achieve noticeable economic growth, increase labor productivity, and create new sectors. Results of the study: 1. The analysis of the digital economy of the Russian Federation is carried out. 2. The role of the state in the development of the digital economy is shown. 3. The weaknesses and strengths of the digital economy are identified. 4. The directions of solving the problems of digitalization of the Russian economy are determined. The methodological basis of the research is the scientific works of Russian and foreign scientists in the field of the digital economy, the results of various applied research on the formation of the knowledge economy (Aetdinova et al. in Life Sci J 11(98):558–561, 2014; Akimov in The government in 2019 will make a decision on the legal regulation of the digital economy, 2018; Demyanova and Zaidullina in IIOAB J 9:164–169, 2018; Denisov in Experts evaluate the contribution of the digital economy to the GDP of Russia, 2017; Galiullina et al. in Dilemas Contemporaneos-Educ Polit Valores 6(84), 2018; Lapina in Intellectual information systems, 2017; Naumkin in Five trends of the

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Keywords Digital technologies · Information · Transformation · Knowledge economy · Analytics · Program · Legislative norms

JEL Codes O10 · O20 · O30

1 Introduction

The rapid pace of penetration of digital technologies into all spheres of modern society leads to changes in the usual models of the economic and social structure of governments. In the wave of this trend, the leading countries of the world to maintain their leadership are betting on the digitalization of the economy; Russia is also involved in this process. E-government and the digital economy are identified as priorities of the Informatization strategy 2019–2024. During this period, the development of the national project "Digital Economy of the Russian Federation" is planned.

The definition of the "digital economy" was used in 1995 by the American computer scientist Nicholas Negroponte at the University of Massachusetts. However, he did not give a clear definition; he used this concept more as a figurative expression, but not a scientific definition. At the present moment, scientists have not come to a common judgment about the digital economy. Scientists' research often uses synonyms of the digital economy such as: "electronic economy", "new technological way of the world", "API economy", "application economy", "creative economy" and others.

2 Materials and Methods

Questions about the analysis of the digital economy are reflected in many scientific studies.

To date, the economy has developed certain methods and approaches for analyzing the digital economy. However, none of them can be considered universal for studying this process.

Dialectical, system-functional, economic-statistical, and formal-logical methods are used as a methodological basis.

3 Results and Discussions

The digital economy refers to all economic activities based on digital technologies, without structural changes in the organization of key financial flows and the work of regulators. Generally, this is the same consumer economy, but with different emphasizes the customer interacts with the seller through information platforms and the product represents information. That's why technologies for big unstructured data analysis processing fast, accurate and less expensive are coming to the fore. These terms also indicated as Big Data, Data Mining (Tereliansky 2016).

These are also machine learning technologies of neural networks, artificial intelligence, designated by such terms as Deep Learning, AI. There is so much data, and it is so heterogeneous and diverse, that simple computational methods do not give the desired results. This allows you to create global information peer-to-peer (P2P) platforms that exclude mediator chains from the supply of items or services.

Besides, this term reflects the ability to use technology to perform tasks and apply activities that were not possible in the past. The concept of digital transformation covers opportunities for existing organizations, such as do better, do something different, and add new things.

Organizations are implementing digital methods of management, resource accounting, financial accounting, etc. All of this affects not only the employees' activities but also on the life of citizens, significantly reducing time losses in particular. For example, digital technologies allow you to quickly send and receive any information; participate more actively in the discussion of public issues (issues of landscaping, urban planning, etc.) through online services of regional and regional administrations, etc.

To compete in the coming years, whether organizations are for-profit, service-oriented organizations, such as health systems or nonprofit and government agencies, will need both leaders and employees who can add innovative ideas. They'll need to use modern technologies such as IoT and prescriptive Analytics to better connect with existing and potential customers and be more responsive and efficient.

Moreover, either they should be prepared to explore the best ways to develop and use new technologies or there is a risk of being left out as the digital economy evolves.

An organization that embarks on a digital transformation strategy needs a vision of its final achievement, and that vision should be more than a statement on the website. For the transformation to be successful, the organization must adapt its vision every day, and employees must know the way of their contribution.

To make digital transformation real, you need a vision and ability to do it.

Digital solutions, meanwhile, represent digital products or services—for example, a medical platform that connected to Phillips or GE's offerings on the industrial Internet.

IT Directors will be required to create a technical basis for digital transformation. Key components include a strong operating basis for efficient and reliable transaction

processing, a digital service platform with reusable data and technology components, that enables data transfer between the base station and the platform.

Organizations in the digital economy have built business architectures to improve efficiency. In the digital economy, with a focus on unified product lines and presenting a unified face to customers, companies will need an architect to accelerate and integrate.

Digital transformers can find a solution to a complex architectural issue because it requires a different organizational structure.

The Russian Federation ranks first in Europe and sixth in the world in terms of the number of Internet users. At the same time, knowledge is an integral factor in accelerating technological development and increasing the competitiveness of products (including on the world market). There is no accident that the digital economy is called the knowledge economy because knowledge plays a crucial role. Thus, it can be claimed that an important component of the digital economy is human capital as a set of knowledge, skills, and abilities. This means that investment in its development, ensuring a continuous stream of innovations that meet dynamically changing needs is the most important condition for creating and implementing digital technologies.

According to the international development rating, Russia is not a world leader in the digital economy and export of IT services (Fig. 1). In our country, there are significant barriers for service imports. According to the Organization for Economic Co-operation and Development (OECD) digital services trade restrictions Index, which is used as an indicator of the Going Digital toolkit, Russia ranks 4th out of 44 countries.

In Russia, there are prospects for the development of the digital economy. First of all, because the Russian school of programming remains strong, developers compete

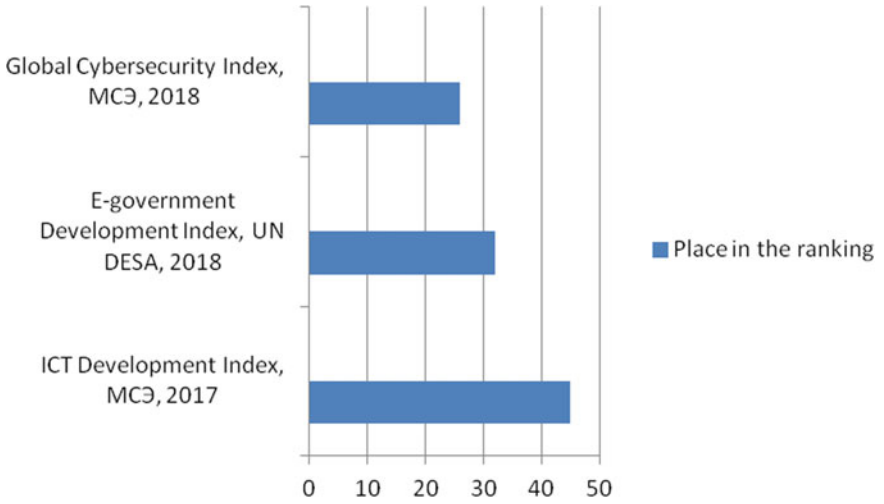

Fig. 1 Russia's place in international ratings of digital economy development. *Source* Compiled by the authors

on an equal basis at the world level. For example, the world's leading oilfield services company Schlumberger claims that more than 80% of its specialists in the field of artificial intelligence development are from the CIS. About half of Samsung's advanced artificial intelligence research Department is also "Russian". Also, the country has a high level of readiness for digital transformation: PwC analysts include Moscow in the top 5 cities in the world for this indicator.

The need for deep legal reform is one of the key challenges of the digital economy. The national project "Digital Economy of the Russian Federation" includes six key areas (Federal projects) required to create good conditions for the introduction of advanced technologies. In General, the project meets the practice of the OECD countries, which also implement strategies and programs for the digitalization of the economy. The project focuses on creating conditions for the development of breakthrough technologies (blockchain, IoT, AI, big data), but does not eliminate barriers to the development of the digital economy (data localization, high load on information mediators). Besides, the development of the platform economy does not pay due attention.

Currently, Federal law No. 34 of March 18, 2019, which creates the basis for regulating relations in the digital economy, is still in force. The law establishes the concept of digital rights and their features in the Civil Code of the Russian Federation and regulates the use of smart-contracts. Specific rules that information systems must comply with the types of digital rights and the specifics of their issuance, must be established by special laws (Kupchishina 2018).

The law "Digital financial assets" is currently being adopted. It was expected that these two documents will determine the legal status of cryptocurrencies in Russia, but it has not happened yet. After a major revision, which was subjected to the law on digital rights, the provisions on cryptocurrency were removed from it.

In 2017, the OECD identified four key breakthrough digital technologies: big data analysis technology, artificial intelligence, Internet of things, and blockchain technology. OECD countries develop strategies for these technologies; create observatories for implementing research projects and bringing together stakeholders (for example, the EU's blockchain technology Observatory). In Russia, it is important to develop these four areas.

The most important tasks to be solved within the basis of the national Digital economy project are to create conditions for the development of the crypto economy, implement a risk-oriented rather than total approach to the data localization requirement, eliminate legal uncertainties in the processing of personal data, and create a favorable condition for the development of big data analysis technologies (usage of new approaches to obtaining consent for data analysis, access to depersonalized data of researchers, and others) (Sazonov 2018). Besides, it is necessary to abolish currency control especially if it restricts the requirement of repatriation. This restriction greatly burdens the development of young companies whose products are exported. And often such companies refuse to export. The adoption of the Federal law on digital financial assets is won't give a strong effect, but the establishment of an AML/CFT requirement for crypto exchanges, thereby legalizing the activities of

banks with crypto assets, as well as the recognition of cryptocurrency as a contractual means of payment will allow the Russian crypto-economy market to develop.

Another main thing is blockchain technology. The emergence of a mechanism of mutual trust and new money changes the structure of society, making a decentralized economy out of just a digital economy. There was a phase transition within the social organism. Now every community can create its own money, or rather, a kind of material containment that needs to be filled with people's labor—capital, the only value of money (Keshelava 2017).

One of the main trends in global digitalization is analytics. New audit tools and automated information security Analytics will soon become key technologies. Information security in Russia was handled by people who came out of law enforcement agencies. In developing security solutions (for example, DLP systems to prevent information leaks), they focused on the real problems of organizations and analyzed the scenarios for which incidents occur. In the West, which traditionally sets trends in the IT industry, they focus only on data, though risks from the human factor are not controlled.

One of the weak aspects is the lack of support for science and research. Support applies only to issues of training of personnel and improvement of IT literacy. In Russia, there are few patents on the Internet of things and AI, blockchain, quantum technologies, automation in production, business, and services. Research and development costs in Russia are no lower than the global average, and their performance is three times lower than the global average (Urmantseva 2017).

In addition, there are regulatory issues. For example, for implementing a "smart" and accessible urban environment, citizens are offered digital services—public transport schedules in Telegram bots. At the same time, regulators recognize Telegram as illegal and try to block it. The Russian software registry requires that Russian software developers support databases and operating systems. There is almost no Russian software system, and even Linux is not widely used both in the country and abroad. Currently, the software is focused on international Windows and iOS. It turns out that the development of software, that is in demand in certain segments of the local market is stimulated. At the same time, based on the national project "Digital economy", the task is to reorient domestic developers for export (Kupriyanovskiy et al. 2017).

To change the situation, the first step is to review the current legislation. Taking into account the peculiarities of the Russian economy—uneven rates of development even within one sector—it is necessary to change the laws gradually. And after the contradictions are eliminated, it is necessary to regulate fundamentally new things: the turnover of cryptocurrencies, digital transactions (separate the concepts of digital offer and digital acceptance), the very concept of information and digital financial assets as objects of civil law. Besides, the legal status of robots or unmanned vehicles is not taken into account.

4 Conclusions

Currently, the digital economy is becoming one of the factors influencing economic growth, leading to the transition to a new stage of production management. Using advanced technologies, the digital economy is changing the picture of competition, blurring borders, changing business models.

In order to effectively develop the digital economy, it is necessary to increase human, intellectual, and technological advantages, to form a flexible regulatory framework for the introduction of digital technologies in all spheres of life.

The strategy of intensive digitalization of the economy will lead to the preservation of Russia's competitiveness in the global market and the achievement of positive results.

Acknowledgements We are very grateful to our parents and colleagues who supported us during the research. We would like to mention the research of scientists in the field of digital economy, as well as analytical reports and materials that have helped us to enrich our ideas and knowledge on this issue. Finally, we would like to express our gratitude and appreciation to all the people who directly or indirectly helped us complete this research.

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Financial Model of Digital Cooperation in Business

Oleg G. Korolev, Veronika V. Yankovskaya, Olga A. Grazhdankina, Vasiliy V. Tkachenko, and Sergei A. Kuchko

Abstract This study aims to develop promising financial models of digital cooperation in business for different world regions through a comparative analysis of European-American and Asian-Pacific business practices. We sampled the top 10 countries by the turnover of the largest cooperative association in 2020 for the experimental part of the study. The main methods of this study are correlation and regression analysis. The results demonstrated a strong correlation between the turnover of the cooperative business structure of the Asian-Pacific region and funding for technological development (−86.31%). We identified the key factors and fields for financing, which were different for the European-American (country credit rating: −9.13%; venture capital: −3.75%) and the Asian-Pacific (funding for technological development: −86.31%) practice. We established that, at the maximum level of the key elements of financial support, the turnover of cooperative enterprises would rise by 708.49% in the Asian-Pacific region and only by 8.96% in the European-American region. The created financial models of digital cooperation in different regions of the world can be used to take into account the specifics of geography and business practices for the most effective financial management of digital cooperation development.

Keywords Financial model · Digital cooperation · Entrepreneurship · European-American model · Asian-Pacific model

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JEL Codes C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

1 Introduction

The COVID-19 pandemic changed business cooperation the same way it changed most other economic practices. Before the global lockdown, business cooperation, in most cases, was aimed at strengthening market positions and involved the collaboration of enterprises concentrated in a common geographical area. After the lockdown, the cooperation of geographically isolated enterprises developed, aimed at building new inter-territorial (interregional and international) added-value chains.

As in other sectors of the economy, the cooperative sector has seen a dramatic increase in business interest in digital technology in 2020–2021. The advantage of the new, digital form of cooperation is that it allows the cooperating enterprises to retain full economic autonomy (without mergers and acquisitions) and define the boundaries and key areas of cooperation. Digital cooperation also bears no additional costs for its participants, unlike other forms of cooperation (clustering, special economic zones, technology parks, and innovation networks).

Despite the advantages of digital cooperation, this form of business cooperation is just emerging and is not yet popular. In this article, we put forth the following hypothesis: "Insufficient development of financial infrastructure is a serious barrier in digital cooperation development. The demand in financial infrastructure is specific to each model of the cooperative sector of economy." In this paper, we aim to identify promising financial models for digital cooperation for different regions of the world through a comparative analysis of European-American and Asian-Pacific business practices.

2 Literature Review

Several studies review the models of the cooperative sector of the economy and identify their differences (Popkova and Sukhodolov 2017a, b; Veselovsky et al. 2018a, b). Various aspects of financing business cooperation have been studied in numerous scholarly papers (Bolgova 2017; Guseva et al. 2019; Medentseva 2017; Tarakanov et al. 2020). Digital cooperation, as a special form of inter-enterprise collaboration, is a subject of the works of several Russian and foreign scholars (Dobra and Dhir 2020; Huang et al. 2020; Kim et al. 2020; Lee et al. 2020).

However, despite all publications on the topic, some aspects of the problem (the impact of financing factors on digital cooperation and territorial differences in the management of digital cooperation) are research gaps. To fill these gaps, we aim to create financial models of digital inter-enterprise cooperation, taking into account modern practices in the different regions of the world.

3 Material and Methods

For the experimental part of the study, we sampled ten countries with the highest turnover of their top cooperative enterprise (in the "producer" category), according to 2020 data (EURICSE 2021). The sample is presented in Fig. 1.

We took the direction of financial support for digital cooperation from the IMD rating for 2020 (IMD 2020). These include the following:

- Funding for technological development;
- Banking and financial services;
- Country credit rating;
- Venture capital;
- Investment in telecommunications.

The values of these indices are presented in Table 1.

The methodological foundation of this study is formed by the methods of correlation and regression analysis. We assume that the hypothesis is correct if the following three postulates are correct:

- The correlation between the turnover of cooperative enterprises (from Fig. 1) and at least one of the factors of finance support (from Table 1) is less than —50%;
- Key factors and directions of financial support will differ in the European-American and Asian-Pacific business practice;
- At the maximum development of key directions of financial support, the turnover of cooperative enterprises will increase by at least 50%.

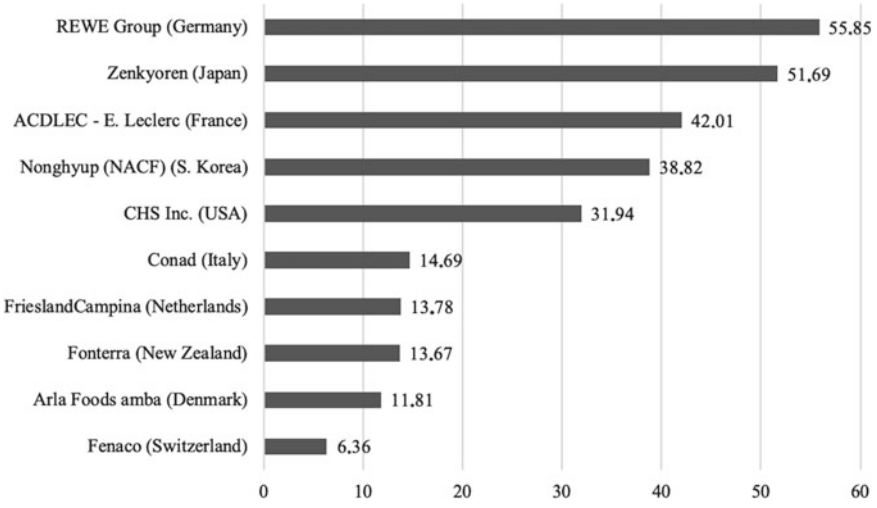

Fig. 1 Largest cooperatives in the sampled countries and their turnover in 2020. *Source* Compiled by the authors based on EURICSE data (EURICSE 2021)

Table 1 Directions of financial support for digital cooperation in business, rank 1–63 (less is better)

Country	Region of the world	Funding for technological development	Banking and financial services	Country credit rating	Venture capital	Investment in telecommunications
Germany	Europe	25	23	1	20	45
Japan	Asia and Pacific	39	40	31	34	52
France	Europe	16	36	16	20	22
S. Korea	Asia and Pacific	38	49	19	41	42
USA	Americas	2	2	11	1	2
Italy	Europe	47	54	48	52	24
Netherlands	Europe	4	15	1	2	43
New Zealand	Asia and Pacific	43	20	14	33	19
Denmark	Europe	6	11	1	13	35
Switzerland	Europe	9	12	1	15	23

Source Compiled by the authors based on IMD data (IMD 2020)

4 Results

Results of the correlation analysis of the connection between the key directions of financial support and the turnover of largest enterprises are presented in Fig. 2.

As shown in Fig. 2, no negative correlation coefficients were found for the global economy, which proves that studying the full sample of countries is counterproductive. In the Asia–Pacific business practices, the correlation of turnover of cooperative businesses and funding for technological development was strong (−86.31%).

The correlation between the turnover of cooperative business structures with country credit rating was moderate (−9.13%) for the European-American business practices. The correlation between turnover and venture capital was also moderate (−3.75%). These dependencies were further elaborated in Fig. 3 with the help of regression analysis.

Based on the paired linear regression equations presented in Fig. 3 and the refining equation of multiple linear regression: $y = 25.10 - 0.22X_1 + 0.15X_2$ for European-American business cooperation (where y is turnover, X_1—country credit rating, X_2—venture capital), we identified the growth prospects for the turnover of cooperative business at the maximum level of key financial support directions in Asian-Pacific (Fig. 4) and European-American (Fig. 5) regions.

According to Fig. 4, at the maximum level of funding technological development (1st place in the world, +97.50%), the turnover of the largest cooperative businesses of the Asia–Pacific region will increase to 280.76 mln. USD (+708.49%).

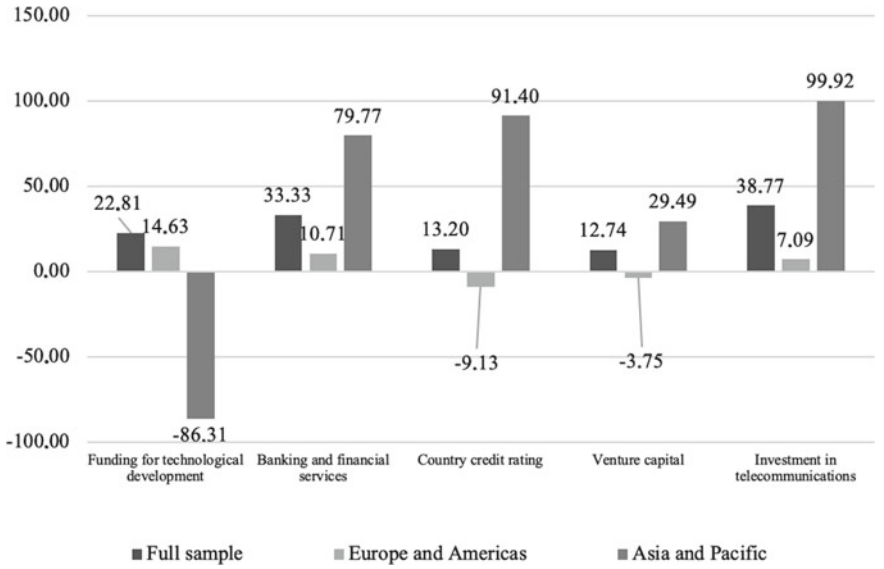

Fig. 2 Cross-correlation between key financial directions and the turnover of the largest cooperative business structures. *Source* Compiled by the authors

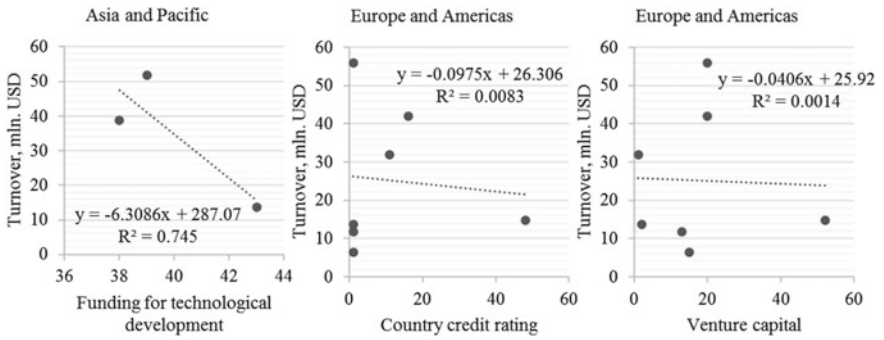

Fig. 3 Regression curves of the dependence between key directions of financial support and turnover of top cooperatives in Europe-American and Asian-Pacific regions. *Source* Compiled by the authors

According to Fig. 5, at the maximum level of the country credit rating (1st place in the world, +91.14%), the turnover of the largest cooperative businesses in the European-American region will increase to 27.46 mln. USD (+8.96%).

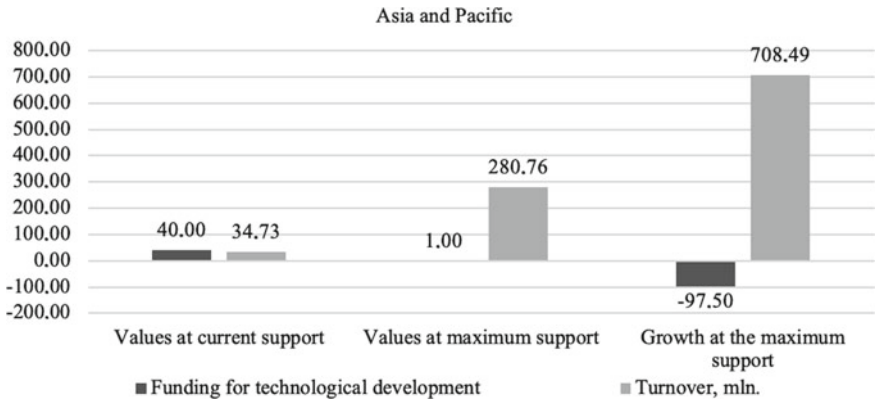

Fig. 4 Growth prospects for the turnover of cooperative business at the maximum level of key financial support directions in the Asian-Pacific region. *Source* Compiled by the authors

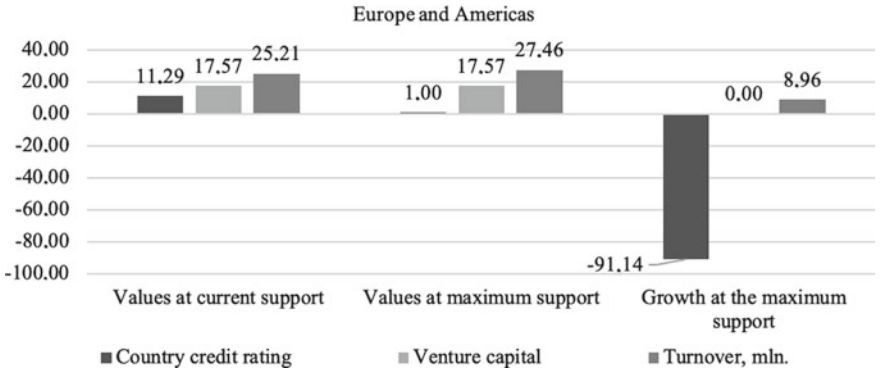

Fig. 5 Growth prospects for the turnover of cooperative business at the maximum level of key financial support directions in the European-American region. *Source* Compiled by the authors

5 Conclusion

The results of the study proved the hypothesis and demonstrated the following:

- The correlation between the turnover of top cooperative enterprises of the Asian-Pacific region with funding for technological development is very strong (–86.31%);
- Key factors and directions of financial support were different for the European-American (country credit rating: −9.13%, venture capital: −3.75%) and Asian-Pacific (funding for technological development: −86.31%) models of cooperation;

- At the maximum level of key directions of financial support, the turnover of top cooperatives in the Asian-Pacific region rises by 708.49%, but only by 8.96% in the European-American region.

The financial models of digital cooperation that we created for different regions of the world allow us to account for the geographical and business specifics to maximize the efficiency of managing the development of digital cooperation.

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Digital Transformation as a Strategic Direction Business Development in Modern Conditions

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Abstract At present, we are witnessing the transition to a new level of economic development. And the most interesting thing is that both state-owned enterprises and private companies are coping with the challenges and tasks that the modern world puts before them. Modern challenges and challenges lead to significant changes in the activities of each economic entity. And any changes are difficult. Even more difficult are the changes associated with digital transformation; there are many more nuances, uncertainties and solutions. Digital transformation is an essential condition for changes and the formation of the digital economy, the formation of which takes place both within a single country and at the global level as a whole. The purpose of the study is to define the concept of digital transformation; to identify the differences between the concept of digital transformation and automation and digitalization; to determine the key elements of the digital transformation strategy and the state of digital transformation of state authorities in Russia. In this regard, the article analyzes the prerequisites for the global digital transformation; analyzes the national experience and the significance of the digital transformation of state authorities; justifies the need to identify the key elements of the strategy in order to intensify the digital development of any economic agent and identify omissions in the inaccurate definition of the elements of the digital strategy. Results of the study: 1. The analysis of the concepts of automation, digitalization and digital transformation is carried out. 2. The role of digital transformation for business and the state is shown. 3. The key elements of the digital transformation strategy are proposed. 4. The directions

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for implementing the digital transformation of the business and the environment are identified. The methodological basis of the research is the scientific works of Russian and foreign scientists in the field of digital economy, the results of various applied studies on the formation of a new way of economy. Based on the analysis of domestic and foreign literature, digital transformation appears as a strategic direction for the development of any business and the environment as a whole.

Keywords Digital economy · Automation · Digitalization · Digital transformation · Public authorities · Organization · Elements of the digital transformation strategy

JEL Codes L20 · G20

1 Introduction

Today, the phenomenon of digital transformation is widely discussed in all segments of society. Some believe that this is a fashionable phrase, and the world will continue to exist in the old way. Others seriously think about the ongoing changes in the prerequisites and challenges of digital transformation based on known facts and examples. It is relevant to consider the concept of automation, digitalization and digital transformation as a strategic direction for the development of business and the environment (Tereliansky 2016, 2021).

The very concept of "Digital economy" was introduced in 1995 by the American computer scientist Nicholas Negroponte from the University of Massachusetts in his book "Digital Being".

The official concept of the digital economy in Russia is not legally fixed. The existing key formulations include the following: the economy of a new technological order; activities in which the key factor of development is data in digital form.

It is also an economic activity that results from a huge amount of online communication between people, companies, devices, data, and processes.

If earlier it was said that people communicate with each other using e-mail and people and companies when they visited the websites of companies, now this information circulates between different objects.

Thus, the basis of the digital economy is hyper-connectivity, that is, the growing connectivity of subjects and objects as a result of the development of the Internet, mobile technologies and the Internet of Things (Table 1).

Table 1 shows that many years have passed since the use of the terms "automation" and "digitalization". During this time, the requirements and expectations for digitalization have changed significantly in society and in the economy. Currently, for further digitalization of business processes, it is necessary to transform the activities of any economic agent.

Table 1 Stages of digitalization of business processes

Automation	Digitalization	Digital transformation
Implementation of IT solutions that replicate existing processes	Improving existing processes by implementing IT Lean methods of process optimization Process reengineering Data analysis for decision-making	Significantly reduce transaction costs through the use of platforms and the emergence of new business models Combining the capabilities of information technology and the current activities of the organization with the subsequent emergence of new types of products and processes of a different quality

Source Developed by the authors

At the same time, digitalization concerns certain areas of the organization, for example, digitalization of the marketing function or digitalization of production, digitalization of procurement ones (Burkaltseva et al. 2018).

But the most important thing is that the more processes are digitized, the more the business model of economic agents becomes digital.

The main difference between digitalization and digital transformation is that digital transformation affects not only individual aspects, it also affects business processes, and leads to the emergence of new competencies of personnel and, most importantly, changes the business model of the company as a whole.

Thus, automation is an activity in which subjects make processors, computers, work, which in turn power certain physical systems. All of this helps us to produce something faster and cheaper than before.

Digitalization is an activity that also allows us to multiply the productivity of different processes, but this time by using digitized information combined into a single whole, which is also the virtual world.

In turn, digital transformation is the optimization of an organization's business model using digital technologies. This applies not only to one activity; it covers different aspects of the company: sales, marketing, logistics, production, and other areas.

2 Materials and Methods

The research is based on the fundamental principles of economics and management; the works of scientists on the digital economy.

Currently, the economy does not have a clear definition of the concept of digital transformation, and there are no methods and approaches for its implementation. Therefore, this article considers the essence of the digital transformation of an economic entity, the prerequisites for business transformation, and the key elements

of the transformation strategy that must be implemented in every modern organization and public authorities in order to achieve success.

The research is based on the methodology of scientific knowledge, economic analysis and a systematic approach. The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as (Baranov 2018a, b, c, 2019; Burkaltseva et al. 2018; Chen et al. 2018; Tereliansky 2021).

3 Results and Discussions

In modern conditions, there is still a lot of work to be done in the direction of digital transformation of society, economy, and business. Nevertheless, for 2020, the following main guidelines were formed, in general.

First, it became clear that digital transformation is really a priority for the Government. And this was reflected in the presidential decrees, when digital transformation rose to the level of one of only five national development goals.

Secondly, over the past year, there were a lot of revisions in the national program "Digital Economy" and at the end of the year, there was a more formalized and understandable prioritization of what is expected in public administration.

First of all, this is an accelerated transfer of the provision of services to an electronic form on the public services portal. And the period of the pandemic spurred and accelerated the withdrawal of new social payment services, which is fast even by the standards of commercial organizations, which was only discussed for two or three years.

On the other hand, "Super Services" or integrated public services were launched, which were planned at the launch of the digitalization program in 2018–2019, which indicates the continuation of work in this direction. Thus, "Super services", public services in electronic form and online—it is fast and convenient and obviously one of the priorities.

The second priority is artificial intelligence (AI) and its implementation, both in the activities of government agencies, and their provision of Datasets (Data sets) for developers, which will be the main achievement of 2021.

Since the population has learned how to work with public services, now we need to learn how to work with big data, AI technology, and the community.

And finally, the third priority is to focus on feedback from the population, the launch of the regional management center, the feedback platform, the ability to file complaints and, ultimately, the change in the process of working with citizens' appeals.

Currently, these are the main priorities, which can be called, including strategic ones (Niyazbekova et al. 2021a, b).

Currently, the key target indicators of the digital transformation of society and the economy are considered to be the growth of the well-being of citizens, the quality of public services, and the number of users (Baranov 2019).

Digital technologies should serve the common task of economic growth, with the aim of realizing this by every person.

Thus, at the center of the digital transformation of society and the economy is the value for a person or citizen.

On the part of the supervisory authorities, the main result of their work over the past two years is that the consciousness of civil servants, employees of enterprises and the general population has really begun to change.

It is important to note that any tool of digital transformation without its use by people is useless (Petrova and Kuznetsova 2020).

But the most important thing is that the tools are beginning to be used, people are armed with these tools and with the help of them get the result that really changes their work, making it much better, less time-consuming. And thus, it gives the result that everyone is striving for—a new type of control and to model and evaluate systemic issues and develop recommendations for their solution.

Thus, the transformation takes place both in operational analytics and in decision-making to a certain extent predictive-predicative.

And on the basis of the tools that the control and supervisory activities are currently developing and providing, the inspectors independently begin to make various analytical products that are used primarily in expert-analytical activities.

A kind of library of such cases begins to accumulate, and they become the basis of the knowledge base that will be used by the Accounting Chamber of the Russian Federation. Currently, this knowledge base already has about 20 cases.

According to the strategy of the Accounts Chamber of the Russian Federation, adopted more than two years ago, it is understood that the chamber will be able to become a center of competence and to a large extent a consultant for solving various types of systemic problems.

The control and supervisory activities of state bodies are moving to solving analytical problems and moving away from identifying formal errors (late payment, wrong article, wrong documents, etc.) to more global and systemic problems and recommendations on how to solve these problems.

The development of any strategy begins with the definition of a starting point. And here, as in the implementation of digital changes, there are a lot of directions. This includes personnel, data, and digital infrastructure.

One of the most important areas of change is working with people. The Center for Advanced Management Solutions held special meetings with each department of the Government of the Russian Federation to conduct a self-assessment to determine the level at which we are. In this regard, explanations, explanations, and working with people are the most important things.

Based on the research conducted by the Center for Advanced Management Decisions at the end of 2020 on digital maturity, an increase in the level of public understanding of digitalization was revealed.

It is very important to note that digital transformation is often associated with information technologies, but digital transformation is also a matter of strategy.

In the scientific world, there is no single understanding of the digital transformation strategy and its components. When building any strategy, as a rule, at least 9

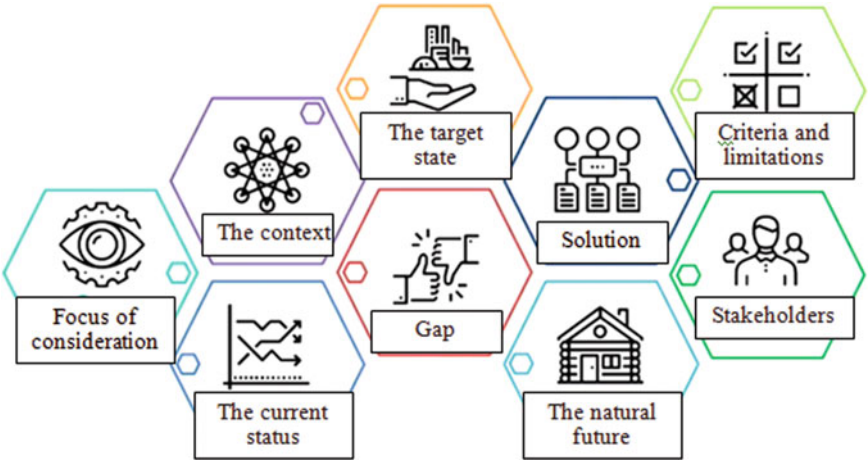

Fig. 1 Components of the digital transformation strategy. *Source* Developed by the authors

of its elements are defined. In this regard, the following components of the digital transformation strategy are proposed, which are presented in Fig. 1.

Figure 1 shows the 9 components (sections) of the strategy that will allow for the digital transformation of any economic agent. Let's look at them in more detail:

1. The focus of the review is to present the goal of the strategy and the necessary resources to achieve it.
2. Context—what happens in the outside, giving up which I will not understand the next steps.
3. Current state-determination of the current state of the economic agent.
4. The target state is the state that the economic agent should achieve.
5. The gap is the difference between the current and target state that needs to be overcome.
6. The natural future is the state in which an economic agent continues to work without making any changes in its activities.
7. The solution is the measures that will lead to a change in the current state (project portfolio, strategic initiatives, etc.).
8. Criteria and restrictions are the establishment of direct or indirect rights and obligations to achieve the target state.
9. Stakeholders are individuals or organizations that are interested in a digital transformation strategy.

The target strategy should be designed for a period of no more than 3 years.

In the case of the absence of one of the components or its unclear definition, the integrity of the picture is not sufficiently objective.

All the components of a digital transformation strategy should be arranged in a certain sequence in the form of an iceberg.

Table 2 Inaccuracies in the description of the elements of the digital transformation strategy

Strategy element	The essence of omissions	Questions to identify
Gap	Vaguely worded	Why change something?
Decision	Undefined and defined inaccurately	What programs and projects contradict each other?
Criteria and restrictions	Not defined or not clearly defined	What actions should be taken if there are insufficient resources to implement the strategy?
Stakeholders	Their opinion is not taken into account	The strategy does not suit the stakeholders
Context	The strategy is not clearly described	What additional resources and actions are needed to fully implement it?
Focus/Border	Undefined or indistinctly highlighted	What separates the strategy from the reality of the situation in the organization?
Current state A	Undefined and defined inaccurately	At what stage of the implementation of the strategy is the organization?
Target state B	Undefined and defined inaccurately	How should the performers act when implementing the strategy?
The natural future	Not described	In the absence of changes, what is the future of the organization?

Source Developed by the authors

The first two components are themselves essential and popular. These are "Solutions" (plans, projects) and "Indicators". The remaining components are usually only superficially defined by organizations.

If the strategy component is not clearly defined, then difficulties arise in the digital transformation of the organization's activities. Examples of shortcomings are presented in Table 2.

Thus, in the case of a vague definition of a component or a number of components, the strategy will not be fully implemented and achieve the main goal. As a result, this can lead to a complete defocusing of the organization's activities.

Therefore, any strategy should be described in detail, for example, in terms of these 9 components. At the same time, these components should not contradict each other, but should be interconnected. That is, a systematic approach and critical thinking when creating a strategy is the key to success, just like customer-centricity, customer-orientation, which is demonstrated by the entire state.

For a better understanding of digital transformation, the percentage of parameter gaps should be clearly defined. And the gap cannot be 5–20%, but radically different. For example, the complete elimination of the need for personal interaction with public authorities when receiving public services, this is a significant acceleration, i.e., this

change in parameters is tens of times, and sometimes hundreds of times (Burtseva and Zueva 2018).

In order for the relevance of the strategy not to be lost, this document should become a kind of "guide" or "road map of the future" with which people check and work on it and, if necessary, adjust it. And the practical value of this document is a key sign that the document is working.

As previously revealed, the transformation process is very complex and affects the entire organization. The organization has a lot of centers of influence, many interest groups, which are often opposite to each other. To identify these interests, to balance them, and to propose the tools that will satisfy most of these interests—this is the main task of the document called "Strategy".

The main task in this case is to understand the actions to achieve the transformation.

The next step is to collect meaningful experience from similar organizations. An analysis of where not only state-owned companies go, but also commercial companies that are engaged in approximately the same functions.

Analysis of what technologies will be used in the areas in which the work is being carried out (with figures, with texts, with documents).

It is necessary to have a certain courage to make a decision and then build a mechanism that will allow this decision to be constantly checked for its correctness as it is implemented, to modify it. However, the most important thing is to move towards the goal that was originally stated, constantly checking it, making this document "live", and then detailing it in certain work plans.

Also, the most important issue is the issue of feedback, the issue of change control. When such a system is built, a working document is obtained, with which it is possible to work, which is a real tool and sets the guidelines, the basis for planning and organizing the activities of any economic entity on the horizon on which these goals were set.

4 Conclusions

Both in Russia and in the world, the transition to a new model occurs when, on average, at least 40% of operations in the industry are carried out in digital form, that is, it begins to change in favor of "numbers". And at this point, the participants understand that they need a clear plan or strategy for development, because they will not be able to develop without new technologies.

And at this point, the world begins to change. Many industries have already passed it, and the public administration system should move in the same direction as they do. To ensure the necessary increase in efficiency, it is not enough just to have an idea and a belief in "Digital Transformation". We need technological prerequisites, namely, the growth of data volume, technologies for storage and processing, as well as ready-made and widely used infrastructure, which is constantly used by customers, manufacturers, intermediaries, and of course, the state.

But this is where the contradiction lies. Currently, business and the public have learned to form chains of interaction, bypassing officials. Citizens receive services that the state does not control and does not influence, and businesses collect information about citizens to the extent that the state does not have.

Thus, digital transformation, in its essence, involves the connection of everyone with everyone, with not only people, but also technology, algorithms, software. At the same time, many functions become unnecessary in the process of such transformation. First of all, mediation institutions and agency institutions. Their disappearance is logical, because it is assumed that the data is initially confirmed and known to be true throughout the entire chain of interaction.

Only the state, due to the inertia of the system and the desire for stability, is in no hurry to integrate into these chains and loses a lot. In particular—in this very stability. After all, without understanding global processes, you will not be able to integrate into them and ensure effective regulation.

Thus, digital transformation is a broad concept that includes both the manufacturing sector and the state and social sectors. This process affects all aspects of the development of society. So, this is a qualitative transition to a different management model. In order for it to become possible, it is necessary to simultaneously have several global prerequisites.

The first prerequisite is infrastructure changes. The most significant are:

- data networks, especially wireless ones. As the volume of data grows, faster transmission channels are required. But more importantly, the data becomes available here and now, from anywhere.
- mobile devices. The new smartphones are incomparably more functional, their computing power exceeds the personal computers of the 200s, and they are affordable for everyone.
- data. They are generated by users of programs and applications. Data arises in connection with the creation of new digital objects: photos, videos, books, and others. The volume of information in the world is growing by 30% annually.

The next prerequisite is related to the growth of the volume of data—this is the technology of their storage and processing. And here it is important that the cost of data storage is reduced annually. The rate of decline is from 20 to 50% annually in terms of the cost of a gigabyte.

These prerequisites for digital transformation are now real, measurable, and have practically entered into our lives and the activities of organizations. And we use them without thinking.

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Social Factors of Business Structures Cooperation in the Modern Economy

Economic-Mathematical Modeling as a Tool for the Development of Consumer Cooperatives

Andrey V. Potashev and Elena V. Potasheva

Abstract The social mission of consumer cooperation is vast and extensive. Consumer cooperatives serve a large number of settlements in Russia, including rural, hard-to-reach, or sparsely populated communities. Relations between enterprises of consumer cooperation raise the question of efficient planning that would account for the interests of all of them. The delivery of goods to consumers is an integral part of the activities of these enterprises. Obviously, this part of the business also requires optimization and reduction of overhead. Economic-mathematical modeling is an important instrument for optimal decision-making, among which the input–output model is especially efficient. Transportation problem is an effective tool for optimizing transport overhead. In this article, we propose introducing economic-mathematical modeling into the practice of consumer cooperatives: dynamic input–output model for planning inter-enterprise relations and transportation problem for reducing transport overhead.

Keywords Input–output model · Dynamic model · Transportation problem · Optimal solutions

JEL Code C5

1 Introduction

In 2021, the system of consumer cooperation in Russia celebrates its 190th birthday. Currently, there are 1.3 mln. members in more than 2000 consumer cooperatives in 71 regions of Russia. Consumer cooperation actively develops, implementing new modern projects, including digital ones. Digitalization allows increasing the efficiency of cooperative enterprises, improving the quality of life of their members, and providing an impetus for the development of entrepreneurship. Introducing

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digital solutions to cooperation will attract new, modern talents and increase the competitiveness of consumer cooperation.

The inter-enterprise relation between consumer cooperatives requires optimizing their joint activities according to the needs of each enterprise.

Moreover, consumer cooperatives need to deliver the goods directly to consumers, which raises the issue of reducing transport overhead.

Economic-mathematical modeling is an important tool for decision-making (Ivanova et al. 2016; Potashev et al. 2015; Solow 1956, 1957). The input–output model is an especially efficient one. The main mathematical tool for minimizing transport overhead is the transportation problem.

2 Materials and Methods

2.1 Models of Social Product and National Income Dynamics

The interaction of cooperatives on the market, where one enterprise uses the production of another, is similar to the input–output model (IOM).

The theoretical foundations of this model were developed by W. W. Leontief, a Russian mathematician in Berlin. The results were published in the work "Balance of the national economy of the USSR" in Russian (Leontief 1925). This work demonstrated that the indices of interrelation between manufacturing and consumption in different branches of the economy are mainly constant. This fact can be used to predict economic processes.

The IOM was further developed in the works of Shatilov (1967). He proposed the dynamic inter-branch model of the economy. Other dynamic models of IOM were developed later (Granberg 1985).

The classical IOM can be presented by a system of algebraic equations, named **Leontief's equations**. The matrix equation looks like this:

$$X = AX + Y \tag{1}$$

Leontief's Eq. (1) shows the relation between the matrix $X = (x_i)_{n\times 1}$ of goods produced by n branches and the matrix $Y = (y_i)_{n\times 1}$ of the consumption of these goods. The linking matrix is $A = \left(a_{ij}\right)_{n\times n}$, represents direct cost coefficients. The equation presupposes that all values in it are averages over a certain period.

In real-case scenarios, the manufacturing volume over a certain period (left part of Eq. 1) is determined by its consumption over the previous period (right part of Eq. 1).

Therefore, if the mark the consumption period as t and the manufacturing period as $t + 1$, the Leontief equation takes the following form:

$$X(t + 1) = AX(t) + Y(t)$$

Then, we get a system of linear difference equations:

$$\begin{cases} x_1(t+1) = a_{11}x_1(t) + a_{12}x_2(t) + \cdots + a_{1n}x_n(t) + y_1(t), \\ x_2(t+1) = a_{21}x_1(t) + a_{22}x_2(t) + \cdots + a_{2n}x_n(t) + y_2(t), \\ \quad\vdots \qquad\quad \vdots \qquad\quad \vdots \qquad \ddots \qquad \vdots \qquad\quad \vdots \\ x_n(t+1) = a_{n1}x_1(t) + a_{n2}x_2(t) + \cdots + a_{nn}x_n(t) + y_n(t). \end{cases} \tag{2}$$

Let us find the solution to System 2 on the example of the manufacturing matrix $X(t)$ of a two-branch economy (two cooperatives that consume the produced goods of each other) with the matrix of cost coefficients:

$$A = \begin{pmatrix} 0.2 & 0.3 \\ 0.3 & 0.2 \end{pmatrix}$$

The consumption matrix takes the following form:

$$Y(t) = \begin{pmatrix} 2^t \\ 2^t \end{pmatrix}$$

It describes the two-fold increase in consumption in each subsequent period. In this case, the System 2 looks like this:

$$\begin{cases} x_1(t+1) - 0.2x_1(t) - 0.3x_2(t) = 2^t, \\ x_2(t+1) - 0.3x_1(t) - 0.2x_2(t) = 2^t, \end{cases} \tag{3}$$

System 3 is a system of nonhomogeneous linear difference equations. The solution to System 3 is expressed as the sum of the specific solution $X_n(t)$ to System 2 the general solution $X_o(t)$ to the system of corresponding homogeneous difference equations:

$$\begin{cases} x_1(t+1) - 0.2x_1(t) - 0.3x_2(t) = 0, \\ x_2(t+1) - 0.3x_1(t) - 0.2x_2(t) = 0. \end{cases} \tag{4}$$

Using the method of undetermined coefficients, we get:

$$X_o(t) = \begin{pmatrix} 2/3 \\ 2/3 \end{pmatrix} \cdot 2^t$$

The general solution $X_n(t)$ to System 4 looks like this:

$$X_n(t) = C_1 \begin{pmatrix} 1 \\ 1 \end{pmatrix} \cdot (0.5)^t + C_2 \begin{pmatrix} 1 \\ -1 \end{pmatrix} \cdot (-0.1)^t$$

Then:

$$X(t) = X_o(t) + X_n(t)$$
$$= \begin{pmatrix} 2/3 \\ 2/3 \end{pmatrix} \cdot 2^t + C_1 \begin{pmatrix} 1 \\ 1 \end{pmatrix} \cdot (0.5)^t + C_2 \begin{pmatrix} 1 \\ -1 \end{pmatrix} \cdot (-0.1)^t \quad (5)$$

The arbitrary constants C_1 and C_2 are derived from the following initial conditions:

$$X(0) = \begin{pmatrix} x_{10} \\ x_{20} \end{pmatrix}$$

2.2 *Optimizing Transport Overhead via the Transportation Problem*

Even the simplest transport system (Tolmachev 2013) that consists of a few suppliers and consumers can present a large number of options to organizing the transportation of goods. Choosing the right option is extremely important for business. Criteria for choosing optimal options can be: minimizing transport overhead, reducing time consumption on deliveries, etc.

Planning transportation via transportation problem requires setting the following initial values: n—number of suppliers; m—number of consumers; A_i—supply of goods that the ith supplier has; ($i = \overline{1, n}$); B_j—demand for goods of the jth consumer ($j = \overline{1, m}$); c_{ij}—rate for transporting a unit of goods from the ith producer to the jth consumer.

In the classical transportation problem, x_{ij} variable denotes the volume of goods to be transported from the ith supplier to the jth consumer, while the optimization requirement is minimizing transport overhead. These values take the form of the following function:

$$F = \sum_{i=1}^{n} \sum_{j=1}^{m} c_{ij} x_{ij} \to \min \quad (6)$$

Moreover, there are several constraints to x_{ij} values. First of all, x_{ij} cannot be negative:

$$x_{ij} \geq 0, \quad i = \overline{1, n}, \; j = \overline{1, m}, \quad (7)$$

Second, the existing supply of goods and the consumers' demand must be accounted for.

Let us look at the simplest closed (balanced) transportation problem, in which the supply of producers is equal to the sum demand of all consumers, expressed by the following constraint:

$$\sum_{i=1}^{m} A_i = \sum_{j=1}^{m} B_j \tag{8}$$

This constraint allows using up all of the supply and meeting all of the demand. In this case, the volume of transported goods must be equal to the supply of the *i*th supplier, and the volume of delivered goods must be equal to the needs of the *j*th consumer. These constraints take the following form:

$$\sum_{i=1}^{n} x_{ij} = B_j, \quad j = \overline{1, m} \tag{9}$$

$$\sum_{j=1}^{m} x_{ij} = A_i, \quad i = \overline{1, n} \tag{10}$$

If Constraint 8 is not met, the transport problem is open (unbalanced). In this case, either a fictitious supplier or consumer is added so that the Constraint 8 is met, or the Constraints 9 and 10 take the form of inequalities ($\leq$ instead of $=$).

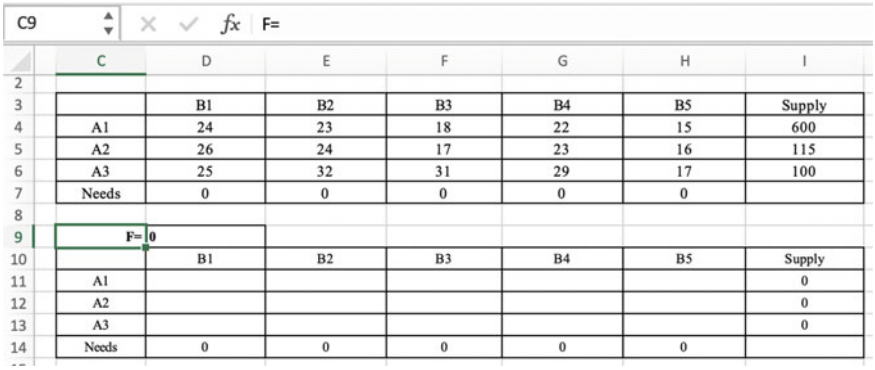
In the case of real transportation planning, choosing the plan that minimizes transportation overhead is extremely important.

2.3 Solving Transportation Problem in Microsoft Excel

There are many well-designed mathematical methods for solving the transportation problem. However, they are very difficult to use for most people. For this reason, we advise the staff of cooperatives to use the easily-available Microsoft Excel program. It contains the "**Solver**" add-in that allows solving the problems of linear programming, including transportation problem.

3 Results

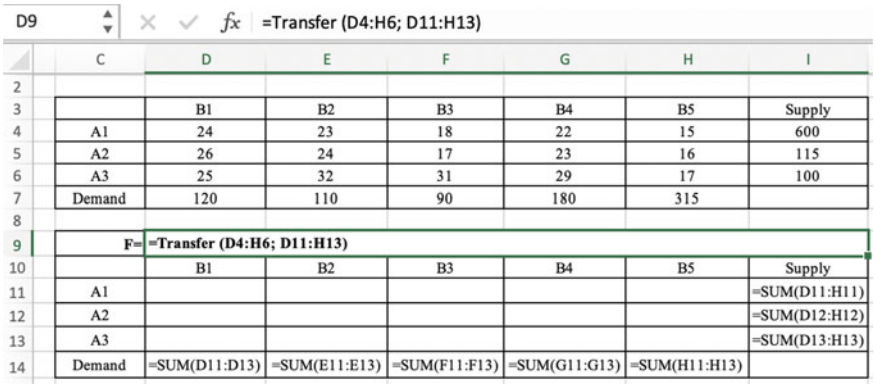
Let us review the stages of solving transportation problem on the example of a balanced transportation problem with three suppliers and five consumers. The initial data is presented in the top part of Fig. 1.



C9 fx F=

	C	D	E	F	G	H	I
2							
3		B1	B2	B3	B4	B5	Supply
4	A1	24	23	18	22	15	600
5	A2	26	24	17	23	16	115
6	A3	25	32	31	29	17	100
7	Needs	0	0	0	0	0	
8							
9	F=	0					
10		B1	B2	B3	B4	B5	Supply
11	A1						0
12	A2						0
13	A3						0
14	Needs	0	0	0	0	0	

Fig. 1 Initial data. *Source* Compiled by the authors



D9 fx =Transfer (D4:H6; D11:H13)

	C	D	E	F	G	H	I
2							
3		B1	B2	B3	B4	B5	Supply
4	A1	24	23	18	22	15	600
5	A2	26	24	17	23	16	115
6	A3	25	32	31	29	17	100
7	Demand	120	110	90	180	315	
8							
9	F=	=Transfer (D4:H6; D11:H13)					
10		B1	B2	B3	B4	B5	Supply
11	A1						=SUM(D11:H11)
12	A2						=SUM(D12:H12)
13	A3						=SUM(D13:H13)
14	Demand	=SUM(D11:D13)	=SUM(E11:E13)	=SUM(F11:F13)	=SUM(G11:G13)	=SUM(H11:H13)	

Fig. 2 Formulae. *Source* Compiled by the authors

The solution to the problem will be presented at the bottom of Fig. 1. The formulae for summing up the transportation overhead (D9), supply consumption (I11:I13), and meeting the demand (D14:H14) (Fig. 2).

After inputting the data and the formulae, we launch the "Solver" add-in and fill the fields according to Fig. 3.

As a result, the bottom part of the table (D11:H13 in Fig. 4) now features the transportation volume and the costs of all transportations (D9).

4 Discussion

These results demonstrate the capabilities of Microsoft Excel. The relative simplicity of use and availability of Microsoft Office allows consumer cooperatives to easily

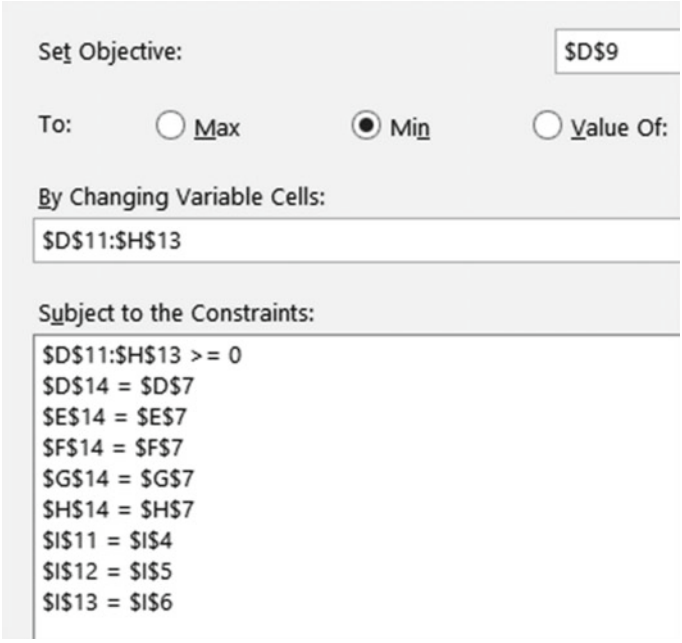


Fig. 3 Forming the terms of the transportation problem. *Source* Compiled by the authors

C9 fx F=

	C	D	E	F	G	H	I
2							
3		B1	B2	B3	B4	B5	Supply
4	A1	24	23	18	22	15	600
5	A2	26	24	17	23	16	115
6	A3	25	32	31	29	17	100
7	Demand	120	110	90	180	315	
8							
9	F=	15750					
10		B1	B2	B3	B4	B5	Supply
11	A1	20	110	0	180	1290	600
12	A2	0	0	90	0	25	115
13	A3	100	0	0	0	0	100
14	Demand	120	110	90	180	315	

Fig. 4 Calculation results. *Source* Compiled by the authors

optimize transport overhead. We note that the "Solver" add-in of Microsoft Excel can solve even more complex tasks (e.g., greater number of suppliers and consumers, unbalanced problems, etc.).

5 Conclusion

Economics, finance, and sociology are inherently quantitative sciences. Therefore, the methods of mathematical modeling should be a fundamental part of training competent specialists in socio-economic fields of study. Qualified professionals are capable of efficiently using economic-mathematical models for the planning and management in the interrelations of cooperative enterprises.

Everyday activities of consumer enterprises should use all kinds of digital services. For this purpose, the educational organizations train highly qualified personnel capable of solving the most pressing problems and taking cooperation to a new level.

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Import Dependence in the System of Marketing Phenomena of Competition and Competitiveness of the Cooperative Sector of the Economy at the Meso Level

Oksana V. Martynenko, Victoria B. Gorbunova, Svetlana F. Bolshenko, Vladimir N. Mashkov, and Igor Y. Krasnyansky

Abstract The purpose of this article is to determine the place and role of import dependence in the system of marketing phenomena of competition and competitiveness of the cooperative sector of the economy at the meso-level. The authors believe that only systemic growth in the competitiveness of products and national producers in domestic markets is a fundamental factor in promising national competitiveness, the applied implementation and commercialization of which depends not only on the operational and financial results of individual market structures, but also on the level of self-sufficiency of the Russian economy with the main types of products, as well as economic security and stability of the functioning of the Russian economy as a whole. The author's research approach to determining and understanding the causes and consequences of import dependence in the domestic markets of the products of the cooperative sector of the economy allows us to move to the modernization of managerial marketing tools aimed at reducing import dependence and ensuring effective and systemic import substitution, which is based on increasing the competitiveness of domestic products and its manufacturers within the framework of a multi-format marketing model of industrial business. Import substitution is a structural element of the marketing and industry strategy for the growth of competitiveness of both Russian products in general and producers of the cooperative sector of the

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economy in particular, the ultimate goal of creating and managing the development of a competitive and innovatively oriented industry production structure, the unique trade offer of which will be competitive both in the domestic market.

Keywords Import dependence · Competitiveness · Competition · Marketing tools · Cooperative sector of the economy

JEL Codes F19 · L10 · D12

1 Introduction

The competitive position of enterprises of the consumer sector of the economy is formed in the market environment under the influence of many factors that either create its competitive advantages in the current, medium and long term, or become barriers to the implementation of strategic projects for the development of consumer cooperation (Gorbashko and Maksimtseva 2014). Currently, there is a need to modernize the existing marketing tools for research and management of the growth of competitiveness of products and manufacturers in the domestic markets of the cooperative sector of the economy, designed to ensure the reliable identification of operational marketing and competitive reserves of import substitution and evaluate their effectiveness for the main groups of marketing entities (manufacturers and members of associations, consumers, intermediaries, industries and the economy of the country as a whole).

2 Materials and Method

The issues of import dependence within the marketing systems of domestic industrial markets were touched upon by a number of domestic researchers in connection with research on sectoral industrial competitiveness and were considered as a promising reserve for sales growth and operational efficiency of domestic enterprises: Voronov (2004), Gorbashko (2014), Mazilkina (2009), Rubin (2004), Faltzman (2015), Fatkhutdinov (2005) devoted their works to these studies, the methodology of industry competitive analysis was developed in the studies of Porter (2011).

Existing scientific approaches to the consideration of competition as a factor of a marketing macro environment, which is essential for planning the operational and financial results of corporate entities within industrial markets, are represented by behavioral structural and innovative interpretations. At the same time, it should be emphasized that the approaches discussed are focused on the corporate level of measuring competition and competitiveness, while meso- and macroeconomic market slices and their marketing phenomena and anomalies remained outside the research focus of modern scientists.

At the same time, problems have been identified in the theory and methodology of managing the competitiveness of products and manufacturers in domestic markets, the solution of which will ensure the elimination of import dependence as a significant marketing effect of the meso-level research section, which are caused by an insufficient level of research into the composition of marketing processes for identifying import dependence.

3 Results

In the context of different formats of competitive activity, the competitive environment in consumer goods markets includes a variety of factors, each of which is characterized by its own scope, time of influence and significance (intensity). In order to implement the import substitution strategy, enterprises of the cooperative sector of the economy can use marketing actions of an attacking and protective nature in terms of:

- competitive positioning of the enterprise as the basis for protection against intense competition;
- changing the balance of sectoral competitiveness based on the implementation of the competitive initiative strategy;
- the use of preventive activity in terms of market advance;
- diversification and competitive maneuver towards less volatile competitive segments and markets (Voronov 2004).

Unfortunately, when considering existing and potential competitors in industrial markets, E. A. Gorbashko did not study the problems of national competitiveness in the domestic markets of consumer goods and did not pay due attention to real reserves of competitiveness growth.

Y. B. Rubin, when studying the corporate and industry aspects of competitiveness, points to the following factors that determine the dynamics of this phenomenon:

- the sectoral potential of competition (based on the potential of human, organizational and entrepreneurial resources);
- organizational sustainability, human resources and competitive activity of enterprises and industries;
- the necessary size of the resource capacity;
- efficiency of investment and current costs in the implementation of reproduction activities and competitive activity;
- degree of attractiveness/competitiveness of products/services, loyalty of customers to produced models and promising prototypes;
- reliability and predictability of the enterprise/industry as a competitor;
- assessment of the competitiveness of the enterprise/industry in terms of benchmarking and reengineering;

- attractiveness and image of the enterprise/industry for various representatives of public groups (Bolshenko et al. 2021).

Unfortunately, the author's research did not affect the real conditions of the domestic product markets characteristic of the cooperative sector of the economy.

R.A. Fatkhutdinov considered the problems of formation and management of industry competitiveness in terms of isolation, analysis and development of a specific set of external and internal competitive advantages. Among the external advantages of an industry nature, the author included:

- high competitiveness of the country;
- level of activity in support of small and medium-sized businesses;
- quality of legal regulation of entrepreneurial activity;
- the level of openness of society and markets for key industrial products;
- scientific justification of management actions in relation to the economy of the country;
- level of integration of the standardization system into international metrology;
- the level of State support for research and innovative industrial activity;
- quality of information resources needed to manage the national economic system;
- large-scale integrated production, marketing and financial structures;
- reasonable tax exemptions and managed interest rates for short- and long-term financial and reproductive resources for industry;
- having a full resource potential for sectoral development and a competitive advantage in the cost of resources;
- the quality of the management training system for the country's industry;
- favorable climatic and geographical conditions;
- high level of productive industry competition (Mazilkina and Panichkina 2009).

A critical analysis of the given classification of factors of industrial competitiveness indicates the intuitiveness of their set and the lack of consistency in the formation of the system of industrial competitive advantages. Moreover, two factors directly relate to industry competitive advantages—the industry resource potential and the level of industry competition, the remaining factors characterize the industry competitive environment to varying degrees, but have a very distant relationship to the real level of industrial competitiveness and the formalized assessment of import substitution reserves in domestic markets.

Among the internal competitive advantages of the industry nature R. A. Fatkhutdinov attributed:

- large-scale industry demand;
- an optimized level of industrial industry concentration;
- competitiveness of industry personnel;
- an effective information and regulatory framework for sectoral management;
- availability of competitive suppliers;
- facts of sectoral programs on resource saving;
- high level of innovation and competition;
- competitiveness of the main enterprises of the industry;

- certification and quality management of products and management systems;
- efficient organization of the industry architecture;
- significant exports of industry knowledge-based products.

We need to once again note the absolute intuitiveness of the author's set of industry competitive advantages and the impossibility of moving on their basis to a scientifically justified and quantified sectoral strategy for reducing import dependence based on the growth of competitiveness of products, goods and enterprises participating in the cooperative sector of the economy.

E. I. Mazilkina and T. G. Panichkina suggested that competitiveness on an industry scale should be understood as the effectiveness of the industry group of enterprises, which, in addition to traditional indicators of dynamics and structure, can be assessed by its survivability and dynamism under various scenarios of national economic development (Porter 2011).

Among the factors of industry competitive advantage, the authors mentioned the presence of a rational structure of the industry and the allocation of a strategic group of leading enterprises, the presence of a progressive production base and an industry technological system, development production, the presence and level of development of industry infrastructure and a system of industry cooperation.

The authors consider import dependence as one of the indicators clarifying the formalized assessment of industrial competitiveness, contrasting it with the export orientation and noting the need to consider import dependence in a combination of assessment factors, while neither the definition, nor the mechanism of its occurrence, nor its significance for industrial competitiveness is given in the author's study.

The industry model of competitive analysis developed by M. Porter, in our opinion, is quite applicable in the analysis of the scale, significance and prospects of import dependence in Russian markets of products of the consumer sector of the economy (Fig. 1).

The above visualization is one of the strategic management models, allows us to identify and visualize industry dependencies and their significance/dynamics, to ensure rational decisions on participation/disregard of competition at the corporate and industry level.

Note that M. Porter (Rubin 2004) singled out import dependence as a significant factor in industrial competitiveness, in addition, his model, taken as a basis, allows us to distinguish this factor and evaluate it from the point of view of the power of importers/foreign producers, the current competitive environment and threats of invasion of new participants.

In the author's study by A. A. Voronov, the term competitiveness of industry products is proposed, which allows calculating import dependence as a value opposite to the level of national competitiveness of industry products in the domestic market (Formulas 1 and 2):

$$\mathrm{NKsp}_{\mathrm{ind}} = \frac{V_{\mathrm{ind}} - V_{\mathrm{ex}}}{V_{\mathrm{cons}}}, \tag{1}$$

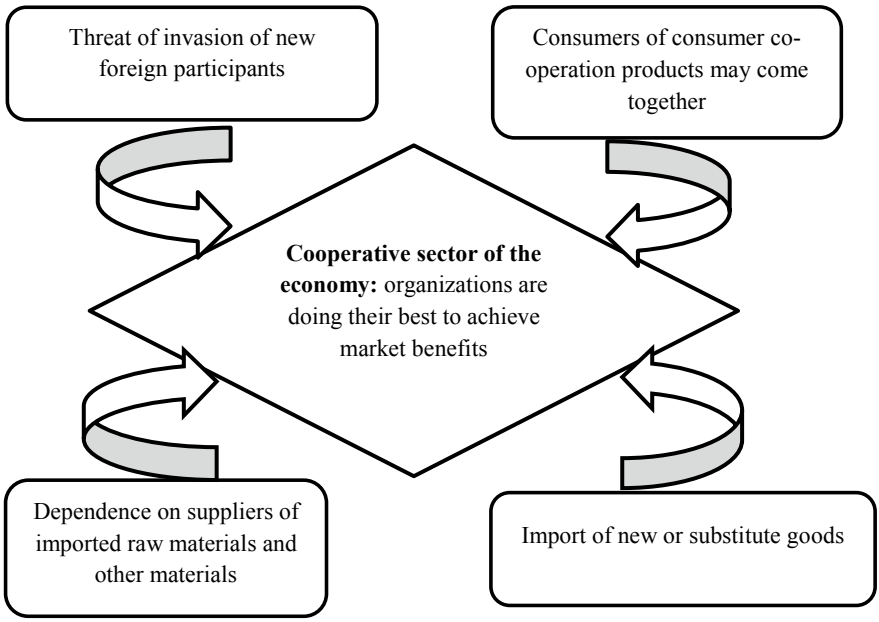

Fig. 1 Industry analysis of competition in terms of import dependence in the markets of products of the consumer sector of the economy. *Source* Proprietary development based on the M. Porter model

where NKsp_{ind}—competitiveness of industry products in the domestic market; V_{ind}—valuation of production in the industry; V_{ex}—valuation of exports of industry products; V_{cons}—valuation of domestic consumption of products (calculated as the amount of stocks for domestic consumption and imports).

$$I_{\text{p}} = 100 - \text{NKsp}_{\text{ind}}, \tag{2}$$

where I_{p}—level of import dependence in the industry product market, % (Faltzman 2015).

We need to note the limitation of the author's approach in terms of identifying import dependence and the entire volume of industrial imports, which, in our opinion, should be structured in terms of formal and real dependence on imports and the real possibility of replacing them if necessary.

V. K. Faltzman notes that reducing import dependence and ensuring import substitution has an economic effect for domestic markets only if there is a comparable competitiveness of domestic and imported products both in quality and functional characteristics and in price. At the same time, the author identifies 4 classes of industries where possible to reduce import dependence:

- industries with local import substitution prospects—export-oriented industries with minimal presence of imports in the domestic market (nuclear power, defense and aerospace products);
- industries with difficult import dependence, the replacement of which in the short and medium term is doubtful (radio electronics, communications products);
- medium-tech industries (automotive, transport and agricultural machinery) with significant potential for import substitution based on both the development of their own production and the concept of "catch-up development" (localization of production of international engineering concerns);
- primary mineral and raw material industries with globally significant development potential and significant domestic market resources (food, woodworking, metallurgy) (Fatkhutdinov 2005).

V.K. Faltzman introduces a formula apparatus for assessing the prospects for import substitution of products based on the calculation of indicators of self-sufficiency and import dependence (Formulas 3 and 4):

$$\alpha = 100 \times (\text{П} - \text{Э}):(\text{П} - \text{Э} + \text{И}) \tag{3}$$

where α—self-sufficiency indicator, П—industrial production of a specific type of product, Э—volume of industrial production exported during the operational cycle, И—volume of imports of a type of product to the domestic market.

$$\gamma = 100 \times \text{И}: (\text{П} - \text{Э} + \text{И}); \alpha + \gamma = 100\% \tag{4}$$

where γ—import dependence factor.

We also need to note the content and validity of such calculations, since they have a clear economic meaning, but we emphasize that the real import dependence and the volume of current imports of products of a particular industry, for example, the cooperative sector of the economy, are not identical to each other and require a deeper qualitative analysis of the components of the import structure for signs of import dependence.

Summing up, we will emphasize the need to modernize the existing marketing tools for research and management of the growth of competitiveness of products and manufacturers in the most important domestic industrial markets, designed to ensure the reliable identification of operational marketing and competitive reserves of import substitution and evaluate their effectiveness for the main groups of marketing entities (producers and participants of ecosystems, consumers, intermediaries, industries and the economy of the country as a whole).

The author's approach to the modernization of marketing support for monitoring, analysis and assessment of import dependence in the domestic market of products of the cooperative sector of the economy includes the following elements:

- identification, factors, characteristics and marketing implications of the emergence and development of import dependence in domestic markets;

- classification of causes and factors of import dependence;
- a marketing mechanism for the formation of import dependence, justified by the specifics and main determinants of consumer decisions of customers—organizations in the product markets of cooperative enterprises;
- classification of types of import dependence according to the degree of its intensity;
- methodology for estimating the intensity of import dependence as a systemic marketing phenomenon in domestic markets.

Import dependence is defined by the authors as the objective impossibility of consumers refusing to purchase and further consumption/processing/use in the production of a specific important type of foreign production.

This author's approach involves the isolation of four types of import dependence in the consumption of products in domestic markets, differentiated by its intensity and socio-economic significance (Fig. 2).

It should be noted that the specific level of import dependence reflects the existence and severity of a systemic marketing problem related to the presence or loss of commodity/corporate competitiveness by national producers in domestic industry and cross-industry markets.

4 Conclusion

Taking all the aforesaid into consideration, we formulate the following conclusions characterizing the author's increase in scientific knowledge in terms of knowledge of the essence and causes of import dependence as a systemic marketing phenomenon of domestic industrial markets.

Import dependence in the domestic industrial markets of PIU products is defined by us as an objective impossibility of consumers' refusal to purchase and continue to use specific types of products and their accompanying works and services. The author's classification of the type of import dependence in the acquisition and consumption of products in domestic national markets implies the separation of four types, differentiated by its intensity and socio-economic significance: initial, increasing, stable, critical.

The author's research approach to determining and understanding the causes and consequences of import dependence in the domestic markets of the products of the cooperative sector of the economy allows us to move to the modernization of managerial marketing tools aimed at reducing import dependence and ensuring effective and systemic import substitution, which is based on increasing the competitiveness of domestic products and its manufacturers within the framework of a multi-format marketing model of industrial business.

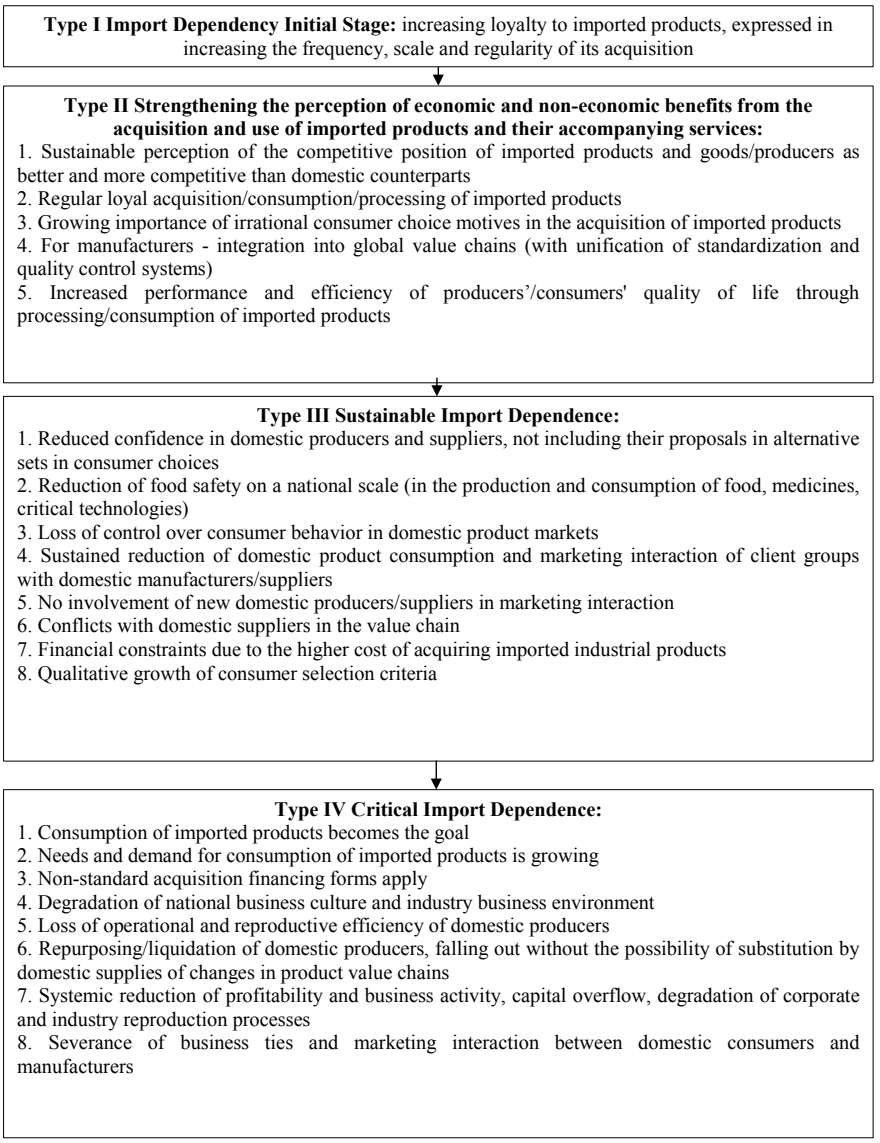

Fig. 2 The evolution of types of import dependence in the consumption of products in domestic markets. *Source* Proprietary development

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Socio-psychological Conditions for Forming Trust-Based Relationships Between Employees in Commercial Organizations

Oksana I. Mironova, Lydia A. Ruonala, and Elena A. Volodarskaya

Abstract The purpose of the research is to identify socio-psychological conditions for forming trust-based relationships between employees in commercial organizations. The authors' conclusions are based on understanding of trust-based relationships as a necessary condition for socio-psychological relations and communication, internal state of readiness to show trust. The authors empirically identify social and psychological conditions for forming trust-based relationships between employees in commercial organizations. Such conditions are the following: management style in an organization, self-confidence of employees and common basic values. The research concretizes psychological approaches to the study of trust-based interpersonal relationships; it is proven that management style, level of self-confidence and shared values of employees are of influence on the forming of trust-based relations between employees in commercial organizations.

Keywords Trust-based relationships · Social psychology · Employees of commercial organizations

JEL Codes M114 · Z130

1 Introduction

Today, in the majority of large Western and leading Russian companies much attention is paid to the problem of corporate culture development and creating a favourable socio-psychological climate in a collective. Without creating conditions for the

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emerging of trust-based relations between employees it is impossible to create such a climate.

Despite the significant interest in the problem of trust from the psychological community its theoretical research leaves much to be desired. Nowadays there is no universally valid concept of trust, there is no theory for trust and its detailed model, leading factors of trust have not been studied, its structural elements, functions, characteristics, and types are not fully identified. The number of empirical studies carried out needs to be increased as the problems of different aspects of trust-based relationships are poorly studied.

Study of trust in the corporate sector is currently one of the most relevant themes in social sciences. Trust was recognized as one of the most important factors determining a company's success (Thanetsunthorn and Wuthisatian 2020).

The problem of developing a corporate culture built on trust-based relationships is especially relevant for Russian companies. On the one hand, it relates to the fact that they are lagging behind foreign competitors in the world market and their lower competitiveness. On the other hand, the reason can be found in the difficulty of adapting to new conditions due to political and economic crises in the country.

At the same time the coping of Western management models in commercial organisations is not possible since corporate and personal values acceptable abroad may not be shared by the employees of organizations in the post-Soviet space and requires rethinking and adaption (Prokopovych and Idobaeva 2020).

Difficulties in transferring of foreign experience to the sphere of personnel management can be connected, first of all, with understanding of the term "trust", which scientists have paid attention to in the past few years. Tranter and Booth, studying the effectiveness of economic models, raise the question of the validity of considering the term of trust as internally stable, free from influence of psychosocial and geographical components and prove that we cannot consider the term trust outside of culture (Tranter and Booth 2019).

Having analysed 491 publications, Hu, Holtz and others have come to the conclusion that the cross-cultural aspect of trust is especially significant in the context of growing globalization when working with personnel. They have concluded that the defining factor of trust in North America is honesty while in East Asia interpersonal trust and friendliness are more important (Hu et al. 2019).

Thus, the corporate sector is interested in specific proposals for the development of work efficiency with personnel while both inductive and deductive methods of studying ideas about trust and trust-based relations become relevant to social psychologists, taking into consideration heterogeneity of ideas about the concept of trust and influence of cultural characteristics in corporate culture.

2 Literature Review

For searching suitable methods and techniques for studying socio-psychological conditions for forming trust-based relationships between employees in commercial

organizations let us consider a more detailed development of ideas about trust and trust-based relations of foreign and domestic psychologists.

The topic of trust in Western psychology started to be developed within therapeutic relations and establishment of trust in the process of therapy. Considerable contribution in the development of ideas about trust was also made by E. H. Erikson—trust in the world, formed during the first years of life, as a basic feeling (Erikson 1968); C. R. Rodgers—problem of trust in terms of influence to self-actualization of an individual (Rogers 1995); A. H. Maslow—factors forming trust, problem of distrust in modern society, trust and self-actualization (Maslow 1954); E. Fromm—belief and trust, trust in relations, loss of confidence in oneself (Fromm 1995).

The theme of trust was developed in sociological science. In the 60s of the last century the study of the role of trust within research of social choices began with the works of M. Deutsch, who combined trust with cooperation and showed that the level of trust was the main factor for establishing long-term interaction. At the same time the main conclusion of the research was that "people demonstrating a higher level of trust in others showed a higher ability to cooperation in comparison with those who were less inclined to trust" (Deutsch 1973).

In the 80s of the twentieth century continuing research of the role of trust in cooperation another authoritative researcher of trust problem, T. Yamagishi, developed a scale measuring ability of a human to mutual trust and cooperation. In accordance with methodology, behaviour of people in a particular situation can be forecasted by determining the level of their propensity to show a high or low level of trust. Being a supporter of the theory of a generalized exchange T. Yamagashi considered trust as an independent variable which was responsible for success in the system of generalized exchange. Later T. Yamagashi combined trust with the theory of goals (Yamagashi 2011).

His own scales for measuring a person's tendency to trust were proposed by J. B. Rotter, who created a method based on the belief that a person's behaviour can be predicted by analysing four variables: behaviour potential, expectations, value of reinforcement and psychological situation. J. B. Rotter defined trust in human relationships as "generalized expectations of a person regarding how much you can rely on words, promises, statements or written statements of another person or a group." At the same time the creator of the theory clearly distinguished such terms as trust, gullibility and belief (Rotter 1971).

The American philosopher and political economist F. Fukuyama proposed the idea that economic prosperity in society was explained not by financial indicators but by level of trust. His works caused significant resonance and a lot of criticism in scientific circles and served as an impetus to new research (Fukuyama 1999).

Modern foreign researchers concretize the *context* where the term trust is applied, consider it from the position of a stable aspect of a personality with certain others and aspect of relationships (e.g., Jones and Shah 2016; Yakovleva et al. 2010); as an aspect of relationships of trust for different situations (Wubs-Mrozewicz 2020), biological aspects of trust (e.g. Bauer 2020), trust in choice of profession (Mironova et al. 2014), trust and professional choice trust in online interactions (Ghafari et al. 2019) etc.

In Russian psychology the first research of problems of trust was the work of V. S. Safonov carried out in the latter half of the 70s of the twentieth century. In his research V. S. Safonov connected confidence in communication with its effectiveness considering mutual trust as a necessary condition for connections between people (Safonov 1978).

Only a few decades later the next remarkable researcher of trust problems and trust-based relationships appeared in Russian psychology giving rise to a whole galaxy of students and followers. T. P. Skripkina became such a researcher. In addition to a considerable contribution to the study of world experience T. P. Skripkina (2000) developed the socio-psychological concept of trust. In the opinion of T. P. Skripkina, "trust is a necessary condition for the emergence of community "us" as a system-forming factor for connecting people with each other". "Quantity" of trust is viewed as a dynamic characteristic influencing the quality side of communication. The higher the level of trust in communication between people, the stronger the ties are expressed.

Depending on interpretation by the participants of communication, trust "gives rise" to different phenomena of interaction performing a function in connecting people. It is in interpersonal relationships that trust is formed and exists. Therefore, T. P. Skripkina concludes that trust-based communication supposes trust-based relationships.

In the works of another outstanding Russian psychologist V. P. Zinchenko trust as a basic and special feeling was mentioned. At the same time the "peculiarity of this feeling is the ability of a person to perceive not only external stimuli but also his attitude to other people in all functions." Emphasizing the necessity of reflection, V. P. Zinchenko writes that in the relationships with people "it is easier to trust than to climb the ladder of ranks of intellectual reflection until you get confused and deceive yourself" (Zinchenko 2001).

A considerable contribution in the development of the problems of trust and trust-based relations in Russian psychology was made by the work of I. V. Antonenko. That researcher developed an integral socio-psychological concept of trust in interpersonal relations. I. V. Antonenko concluded that "trust is a meta-relation that is formed as a generalization of the experience of interaction between an object and a subject but from the moment it has been formed it starts to play the role of a determining factor in behaviour, activity and other relations" (Antonenko 2004).

The main role of trust and trust-based relationships are found in the works of such famous Russian psychologists as K. A. Albukhanova-Slavskaya—trust in another as an initial condition for human communication (Albukhanova 2018); B. F. Porshnev—trust (or suggestion) as initial psychological relationships between people (Porshnev 2010); V. N. Myasishchev—the difference between interaction and communication and at the same time its inextricable connection and others (Myasishchev 2011).

Having analyzed the works of scientists we can come to the conclusion that there are different approaches to understanding trust and trust-based relationships: trust-based relationships as a condition of socio-psychological relationships and communication; trust-based relations as expectation of possible benefit or collaboration; trust in another person with purpose of self-disclosure and personal development;

trust-based relations as information and knowledge exchange etc.; trust-based relations as demonstration of a basic feeling and phenomenon influencing the emergence of other relations (love, friendship etc.); trust-based relations as a generalization of interaction experience and the result of joint activity and others. At the same time the factor of trust stands out as one of the leading in building successful personal and business relations.

Our work will be based on the understanding of trust-based relations as a necessary condition for socio-psychological relationships and communication, internal state of readiness to demonstrate trust.

3 Materials and Method

The theoretical analysis of sources of the research problem, testing, observation forming an experiment was used as research methods. For processing empirical data SPSS.17 software (comparative analysis (Student's T-test), correlation analysis) and Excel 2016 were used.

The following methods were used which showed reliability in Russian: "Reflexive questionnaire of self-confidence level" (T. P. Skripkina); "Methodology for assessing of trust/distrust of an employee in colleagues and management of an organization" (A. B. Kupreichenko); "Methodology of determining of management style by the work collective" (V. P. Zakharova and A. L. Zhuravleva); "Questionnaire of basic values (OTETS)" (I. G. Senin).

Research of social and psychological conditions for the forming of trust-based relationships between employees in commercial organizations was conducted in two stages. At the first stage theoretical research regarding trust and trust-based relationships were carried out.

At the second stage an empirical study was done. The empirical object of the study were employees of two commercial organizations LCC "APS DSK" (hereinafter referred to as APS DSK) and LCC "Wingopeople" (hereinafter referred to as Wingopeople). From the company APS DSK all employees who have worked in the company for more than 1 year except for the manager took part in the study. A total of 36 employees of which 28 were men and 8 were women. The age of employees ranged from 24 to 40 years old. All tested had higher education. From the company Wingopeople all employees who have worked in the company for more than 1 year except for the manager took part in the study. A total of 30 employees of which 12 were men and 18 were women. The age of employees ranged from 26 to 42 years old.

In the beginning of the second stage the study of employees of both companies (APS DSK and Wingopeople) was conducted, a total of 66 under the "Methodology of assessing of trust/distrust of an employee in colleagues and management of the organization" (A. B. Kupreichenko). The results received with the descriptive analysis revealed individual and group levels of trust-based relationships in organizations.

Further with the same tested groups a survey was conducted on the "Methodology for determining management style by the work collective" (V. P. Zakharova and A. L. Zhuravleva) and the prevailing management style in each tested company was identified. After using correlation analysis, the connection between level of trust of employees in others and style of management in the organization was determined.

The next task of this stage of the study was a survey using the methodology "Reflexive questionnaire of self-confidence level" by T. P. Skripkina. At this stage, the individual and group level of self-confidence was determined. After, using correlation analysis the interconnection between the level of trust in others and the level of self-confidence was determined.

The final task of the second stage of the empirical study was a survey using the "FATHER" method by I. G. Senin. At this stage we managed to identify individual and group level of value potential. And using correlation analysis it was possible to prove interconnection between trust of employees in others and unity of basic values.

4 Results

Stage 2.1. of the study showed that average group indicator of the level of trust in colleagues at APS DSK was 1349 out of possible 2160 points which corresponds to 62% and in Wingopeople—1376 out of potential 1800 which corresponds to 76%. The level of trust of an employee in colleagues in APS DSK was 14% lower than in Wingopeople, at the same time the level of confidence between employees in both companies are unevenly distributed.

The analysis of individual results of the study showed that in APS DSK the level of confidence was from 26 to 49 out of 60 possible that corresponded to 43% and 82%. The average level of confidence in APS DSK was 62%, therefore the level of confidence fluctuated around 20% of the average.

The level of confidence of an employee in colleagues in Wingopeople was also distributed unevenly, from 32 to 60 points out of 60 possible that corresponded to 53% and 100%. At the same time the average level of confidence in Wingopeople was 76%, therefore, the level of confidence fluctuated around 24% of the average.

At stage 2.2 of the study APS DSK employees determined directive management style as prevailing in the organization The following empirical data was obtained: 61% directive (authoritarian) management style; 22% collegiate (democratic) management style and 17% laissez faire (liberal) management style.

Wingopeople employees determined the collegiate management style as prevailing in the company. The following empirical data was obtained: 16% directive (authoritarian) management style; 71% collegiate (democratic) management style and 13% laissez faire (liberal) management style.

In order to establish interconnection between the level of confidence of employees in colleagues of the organization and management style, Pearson's correlation analysis was carried out. In APS DSK significant positive correlation between trust in

others and dominating (directive) management style was discovered, $r = 0.645$ (Table 1).

In Wingopeople there was also a considerable positive correlation between trust in others and dominating collegiate management style, $r = 0.561$ (Table 2).

In such a way, correlation analysis confirmed interconnection between trust in others and dominating management style in the organization.

Indicators of self-confidence also demonstrated differences in both companies. The average group indicator of self-confidence in APS DSK was 1452 points out of 1980 possible and in the company Wingopeople—1330 points out of 1650 possible. The level of trust of Wingopeople employees was slightly higher than in APS DSK, 81% and 73% respectively. At the same time the level of self-confidence of employees of both organizations was distributed unevenly.

The level of trust of an employee in colleagues in APS DSK was distributed unevenly from 25 to 51 points out of 55 possible that corresponded to 45% and 91%. At the same time the average level of self-confidence in APS DSK was 73% therefore the level of trust fluctuated by more than 20% of the average.

Table 1 Correlation analysis between trust in others and dominating management style in APS DSK

Correlation scales	*N*	Pearson's correlation coefficient	Significance level $p < 0.01$
Trust in others and directive management style	36	0.645	0.000
Trust in others and collegiate management style	36	−0.247	0.147
Trust in others and laissez-faire management style	36	−0.332	0.048

Source Complied by authors

Table 2 Correlation analysis between trust in others and dominating management style in Wingopeople

Correlation scales	*N*	Pearson's correlation coefficient	Significance level $p < 0.01$
Trust in others and directive management style	30	– 0.526	0.003
Trust in others and collegiate management style	30	0.561	0.001
Trust in others and laissez-faire management style	30	0.143	0.450

Source Complied by authors

The level of self-confidence in Wingopeople was also distributed unevenly from 33 to 53 out of 55 possible which corresponded to 60% and 96%. At the same time the level of self-confidence in Wingopeople is 81% therefore the level of trust fluctuated around 21% of the average.

In accordance with the results of correlation analysis by the Person's method in APS DSK there was positive correlation between trust in others and self-confidence $r = 0.768$ and in Wingopeople there was also positive correlation between trust in others and self-confidence $r = 0.653$, that confirmed a connection between level of trust in others and self-confidence among employees of commercial organizations.

The conducted data collection and analysis of value potential of employees of organizations revealed that APS DSK had significant value potential of 73% while the value potential among employees was distributed unevenly from 60 to 88%. The most signified basic value in the organization turned out "Preserving one's own personality"—84% and the less expressed "Spiritual satisfaction"—62%.

In order to establish possible correlation between trust in other employees and basic values of employees Pearson's correlative analysis was conducted. The significant positive correlation between level of trust in others and basic values of employees was found, $r = 0.618$.

Wingopeople had even more significant value potential of employees of 76% while value potential between employees was also distributed unevenly from 61 to 90%. The most expressed basic value for the organization was "Achievements" and the less expressed was "Active social contacts" of 62%.

The correlation analysis based on Pearson's method also revealed a significant positive correlation between level of trust in other employees and basic values, $r = 0.608$.

Therefore, empirically it was possible to identify social and psychological conditions in forming trust-based relationships between employees of commercial organisations; These conditions are the following: management style in an organisation, self-confidence and common basic values.

5 Conclusion

Research of problematic trust-based interpersonal relations is of continued interest among foreign and Russian psychologists, sociologists, political scientists, managers and representatives of other specialties. Trust is the foundation of interpersonal relationships and affects all areas of our life.

Even though the problem of trust-based relations is of interest to representatives of different sciences there are many aspects of trust-based relations that remain poorly studied. Even fewer aspects are developed within scientific psychology itself. At present there is no universally valid scientific concept of trust and the researchers have different opinions when differentiating such terms as trust, belief, confidence, gullibility, and others. The problem of trust-based interpersonal relations between

employees of commercial organisations is not an exception. There are few empirical researches for this topic.

In the current situation the problem of establishing and forming of social and psychological conditions for trust-based relations between employees of commercial organisations seemed the most interesting and promising to us.

In this research we set and resolved the following tasks:

1. Trust-based interpersonal relations as an object of psychological researches were analysed;
2. Psychological characteristics of trust-based relations between employees of commercial organisations were introduced;
3. Conditions of forming of trust-based relations in psychological science were revealed;
4. Social and psychological conditions of forming of trust-based relations between employees of commercial organisations were identified empirically;

The following hypotheses were confirmed:

1. In commercial organisations there is an interconnection between level of trust of employees regarding their colleagues and management style, level of self-confidence and common basic values.
2. With a democratic management style, the level of trust of employees in colleagues in commercial organisations is higher than with a directive one.

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On the Role of the Individual in the Formation and Development of the Cooperative Movement

Taisiya N. Sidorenko, Vera R. Averyanova, Nonna A. Lavrinenko, Olga V. Bershadskaya, and Julia G. Beach

Abstract The cooperative movement arose during the formation and development of market relations and currently the cooperative form of business attracts the attention of many supporters. Whatever role we attribute to the combination of external circumstances and various prerequisites in the development of the cooperative movement, but, in any case, the work of individuals is a creative force in it. In the current context of the cooperative movement, the role of the individual in the organization and activities of cooperative organizations remains important. In this regard, the study of the historical experience of the organizers and ideologists of the first cooperatives is very relevant. The purpose of this work is to study and determine the contribution of certain prominent individuals to the formation of the cooperative movement and the popularization of its ideas in the public environment. The article considers certain aspects of the activities of advanced educated segments of the population who participated directly in the creation of cooperatives of various types both in foreign countries and in Russia, and concludes that their important role in the development of such a phenomenal social movement as cooperation.

Keywords Cooperative movement · Cooperation · Partnership · Cooperative · Role of the individual · Social needs

JEL Codes B1 · N3

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1 Introduction

The question of the importance of personality in the historical process has always been relevant and, undoubtedly, remains so today. In order to judge the role of the person, you have to look into the environment around her, track how the idea was born, matured and passed into life, turn to a specific, including historical phenomenon. From this point of view, it seems appropriate to focus on the social phenomenon of the cooperative movement, which has shown its significance in the socio-economic development of market economies for more than a century and a half and, at the present stage, continues to attract the attention of a large number of supporters around the world.

Undoubtedly, a person cannot create from nothing, she cannot shy away from the influence of modern conditions. The needs of the environment and time usually pose a problem that needs to be solved. But this external problem only rarely allows only one solution; often there can be several solutions. If even a combination of historical conditions indicates only one known way to meet the needs of society, in which case the role of the individual can often be extremely important. The history of the development of all sectors of the cooperative movement confirms the great role of personal initiative. Let us turn to the first experience of organizing cooperatives and consider the importance of individuals in organizing this process.

2 Methodology

In the process of analyzing the role of the individual in the formation and development of the cooperative movement in Russia and foreign countries, the following research methods were used: comparative, logical, specifically historical, statistical and others.

The main sources of the study were articles and historical materials published in the collections "Cooperation. Pages of history: selected works of Russian economists, public figures, cooperators-practitioners," published by the Institute of Economics of the Russian Academy of Sciences. The analysis of historical sources and works of modern researchers of cooperation made it possible to evaluate the activities of outstanding people of their era, aimed at the development and introduction of cooperative ideas into socio-economic reality.

The theoretical basis of this study was the published works of such scientists as Sidorenko and Rakacheva (2020), Heysin (1926), Chuprov (1909, 2006) and Yakovlev (2001).

3 Results

While it is clear that the need and possibility of establishing cooperative associations arise only under objective socio-economic conditions, the question of the role of the individual in the organization of such powerful social movements is very acute. People who are not indifferent to social needs, to the ideas of social justice, activated social mechanisms that develop into a mass social movement.

It is known that the development of modern forms of credit cooperation is associated with the name G. Schulze, although the idea of cooperation arose much earlier, at the beginning of the nineteenth century. But Schulze belongs to the inherent merit of applying the principle of cooperation to a small loan, which was not done by anyone before him. A modest justice of the peace in the Saxon town of Delice, wanting to help the artisans and workers of his city, arranged in 1850 the first loan partnership, in which each member had to make a small contribution every month and by this means raise funds for issuing loans. Three years after the foundation of the partnership, new partnerships began to appear in Delice, which adopted without changes the charter developed by G. Schulze, and strictly adhered to all his instructions. In 1855, Schulze, convinced of five years of experience in the full suitability of the institutions he created, published his famous essay "On Loan and Credit Partnerships as People's Banks," which spread his ideas everywhere and caused numerous imitations of the first banks in Germany. G. Schulze managed to combine the disparate details of national credit and cooperation that existed before him in literature and practical experience. In this combination work and in the ability to inspire confidence in it, and lies the unforgettable merit of Schulze.

The ideas of G. Schulze were soon distributed in all countries of Europe. In this process, the importance of propaganda and organizational activities of outstanding personalities was manifested very clearly. Luzzati, a young professor at the University of Padua, did the same for Italy as Schulze for Germany. Having become acquainted in all details with the works and with the practical enterprises of G. Schulze, Luzzati in 1863 published a small book "On the distribution of credit and on people's banks," in which he eloquently proved the usefulness and applicability to Italian conditions of institutions created by G. Schulze. After the publication of the book, Luzzati with a passion set about verbally propagating the ideas expressed in it. Luzzati was largely a copycat of Schulze, but his organizations were not simple copies from German credit partnerships. He had to adapt to Italian laws that did not know workers' associations; on the other hand, he considered the beginning of unlimited liability to be irrelevant to the Italian character. By inserting the principle of limited liability into the content developed in Germany and introducing some other modifications, Luzzati brought foreign form to the special conditions of Italian society and thereby gave it strength and viability.

The people's banks of Schulze and Luzzati were designed mainly for urban artisans and workers, while peasants and farmers took part in them and used their services only to a limited extent. Meanwhile, the need for credit was especially urgent among the rural population, which, due to its distance from money centers, was the main

victim of usury. But the rural population was especially difficult to succumb to any innovations. To overcome the distrust of the peasantry, to accustom him to the use of complex forms of credit fell to the burgomaster of a small rural community—F. Raiffeisen. In 1864, he established the Geddesdorf Loan Fund, which served as a prototype of many thousand such institutions that later arose in Germany and were transferred from there to all countries of the world. The main features of the Raiffeisen cash registers are well known. These are small unions, limited for the most part to the confines of one rural community, composed of people who know each other closely and are connected by ties of full solidarity. The purpose of this union was not only to issue loans to members to improve their production, but also to meet various other economic needs of them, such as buying the necessary tools and materials for production, selling farm products, etc.

It was not easy to convince the peasants to bind themselves with a circular mandate, without which it was impossible to obtain the capital necessary for operations; however, Raiffeisen, thanks to his perseverance and amazing energy, managed to gradually overcome the difficulties. He bypassed the villages, delivered fervent sermons to the peasants, talked with outstanding masters alone, trying to recruit at least a few, even at least one adherent, in favor of his work. These few elected formed circles of founders, the box office was founded, and others gradually adjoined them.

In France, the distribution of Raiffeisen cash registers was the case of Lyon lawyer Durand. Having met with rural credit institutions in Europe locally and with the help of literature, Durand published in 1891 an extensive essay "On agricultural credit in France and abroad." Having come to the conviction expressed and proved in his book that the most suitable form of rural credit is Raiffeisen-type loan funds for France, Durand actively began to spread his thoughts among peasants since 1892. He traveled to the villages, organized public conversations and made a fervent appeal to all the intelligent forces of the village, inviting them to unite to rid the peasantry of the usury gravitating over him and to deliver him funds, to reform the outdated techniques of the economy. Thanks to his efforts, credit cooperation in France has spread very widely.

Cooperative ideas and their specific experience in Western European countries attracted the attention of public figures and Russia. The development of the cooperative movement in Russia is also, and may be, more owed to the activities of progressive representatives of the liberal nobility. Such figures as: V. F. Luginin, N. P. Kolyupanov, A. V. Yakovlev, A. I. Vasilchikov and others had a great influence on the development of domestic cooperation (Korelin 2009).

At the origins of the origin of credit cooperation in Russia was V. F. Luginin, a descendant of an old noble family of the Tula province. While abroad for a long time, he showed a special interest in cooperative forms of economy. In cooperative societies, Luginin saw a solution to many problems of improving the well-being of the people. The name V. F. Luginin became known in domestic public life in connection with the creation in 1965 by his younger brother Svyatoslav of the first credit cooperative in Russia (Christmas Partnership). After the death of his brother, V. Luginin continued his work, contributing to the development of the country's first cooperative partnership (Podkolzin et al. 2001).

At the end of 1869, V. Luginin, the founder of the first credit company in Russia, together with A. Yakovlev, published a book "On rural loan partnerships," which outlined the significance of these institutions and the main features of their structure. Almost simultaneously, two more essays were published on the description of people's credit in Western Europe and the presentation of guidelines for the foundation and management of people's banks. One of these works belonged to A. Yakovlev, the other N. Kolyupanov. The work of these prominent figures played a major role in the distribution of people's credit institutions in Russia.

N.P. Kolyupanov saw the path to the welfare of Russia in the development of economic "amateur activity," "self-government" of an ordinary working person. In the 60s, he visited Germany and France to study and disseminate Western European cooperative experience in his homeland. He was the author of the book "Practical Guide to the Establishment of Craft and Rural Banks," which, along with the work of A. V. Yakovlev, "Essays on Folk Credit in Western Europe and Russia," became fundamental for the deployment of the cooperative movement. Kolyupanov did not copy someone else's experience, he formed his views and made recommendations on the basis of a deep study of the needs and features of the Russian economic system. N. P. Kolyupanov remained in the history of cooperation as one of the first theorists, practitioners, ideologists, real fighters for the possibilities of economic solidarity (Figurovskaya 2001a).

A great contribution to the popularization of the ideas of credit cooperation in Russia was made by Prince A. I. Vasilchikov. As the largest landowner, he devoted a lot of time to farming on his estates. The study of the economic situation of the peasantry allowed A. I. Vasilchikov to come to the conclusion that a small land loan was necessary and explain this problem to society. He was one of the initiators of the creation of an exemplary charter of a credit cooperative and the creation of the Committee for the Promotion of Credit Cooperation in Russia. A. I. Vasilchikov entered the history of Russian economic thought as a public figure and scientist who was looking for ways to develop society without social upheavals (Figurovskaya 2001b).

A. I. Vasilchikova's associate and like-minded associate was A. V. Yakovlev, a nobleman who devoted his whole life to opening the way for a simple, ordinary worker of Russia to enlightenment and amateur activity. Since the late 60s A. V. Yakovlev became one of the most active propagandists of cooperative ideas. During the years of the deployment of the credit and cooperative movement, A. V. Yakovlev suffered the greatest burden: he spoke in the press and with reports, coordinated the foundations of the proposed institutions in the Ministry of Finance, and participated in the creation of "exemplary charters" of partnerships. In 1876, A. V. Yakovlev, together with A. I. Vasilchikov, published the brochure "Small Land Loan in Russia," which marked a new stage in the development of the idea of cooperation related to the organization of such a form of credit, which was supposed to facilitate the transfer to the hands of direct producers of the main means of production—land. His approach to solving this problem was to purposefully organize the transition of the working masses to market relations through cooperation.

Thanks to the active propaganda of A. V. Yakovlev and Prince A. I. Vasilchikov, who became the head of the "Committee on Rural Savings and Industrial Partnerships" created in early 1871, public credit institutions began to spread rapidly in all parts of the country. They deserve the development of the first exemplary charter that brought the Schulze-Delichev organization to Russian conditions, as well as the dissemination and propaganda of this charter. As a result of the activities of the represented outstanding personalities in the period from 1871 to 1877, 966 loan and savings partnerships arose in Russia (Fine 1994). Therefore, we see the same significance of personal initiative in the formation of the cooperative movement of Russia as in the examples of Germany, Italy and France described above.

4 Conclusion

It is important to note that cooperation was considered by ideologists of that time as a kind of institution of influence on the economic, social, spiritual life of the people in order to reduce the hardships that arose in the process of adapting to developing capitalist relations in the country. And although at that time cooperative organizations did not yet receive proper development, since market relations were underdeveloped and cooperatives were created exclusively "from above," based on a private initiative, the theoretical views and organizational experience of the "pioneers" of cooperation became extremely popular at the beginning of the twentieth centuries, during the period of rapid development of cooperation in Russia.

It can be concluded that the entire history of the formation and development of cooperation is connected not only with the active theoretical activity of prominent individuals, but also with their social, complex organizational work, thanks to which the obliqueness of the population, disunity, disbelief in the possibility of solidarity were overcome. In the current context, when much is said about the revival of cooperation, about the importance of such a mechanism for building a multi-level economy, this aspect is important to take into account. It is necessary to nurture a sense of duty, responsibility for social processes and support people trying to realize their ideas for the benefit of society. At the present stage of the revival of the cooperative movement, especially in the agrarian sector of our country, not only state support is required, but also the active participation of prominent public figures in this process.

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Business Risks Resulting from Errors in the Financial Statements of Companies

Elvira N. Borisova, Tatyana V. Bodrova, Elena V. Ivanova, Alexander M. Zarubetskiy, and Elena V. Zubareva

Abstract The financial reporting process is the most important step in the accounting system. The reporting of any company is not insured against the presence of errors in it, which entail various risks to the business. Financial data play a key role in forecasting, budgeting and developing key performance indicators. The relevance of the problem of the quality of financial reporting was largely felt by Russian companies placing their securities on international stock markets. With increased information flows, business development, automation of production processes, new technologies are introduced to identify errors in the reporting data. The authors used publications on the study problem. This article explains the possible types of reporting errors that occur and their impact on the company. The objectives of the study are achieved by clarifying the classification of detected errors in financial statements.

Keywords Financial reporting · Business risks · Reliability · Errors · Accounting automation

JEL Codes G0 · G3 · M40

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1 Introduction

Accuracy, transparency and completeness are the hallmarks of effective accounting. But for companies without reliable internal control and strict compliance with accounting rules, errors in financial reporting can create labor-intensive and expensive risks that reduce profits and prevent further business growth.

Business risk is usually defined as the risk that the company's business goal will not be achieved as a result of external and internal factors, pressures exerted on the organization, and ultimately the risk associated with its profitability. Business risk ultimately means the risk of an error in the financial statements (Paino et al. 2014).

Accounting involves the acceptable use of estimates and judgments in financial reporting. They are presented in structured form so that they can be easily understood by exchange analysts, rating agencies, lenders and investors. Before the publication of financial statements, its data are often objectively audited by an independent audit firm. However, during the audit, the audit firm examines a sample of financial statements, which is perceived as providing "reasonable confidence" in the reliability of financial statements.

As with all business processes, there are errors in accounting. They can range in severity from minor errors in calculations, permutations and other data entry problems to serious violations such as fraud, significant misrepresentation and violation of law. As a result, there is a risk of reviewing the financial statements and making adjustments to it, which are accompanied by a drop in the value of the company's shares.

2 Materials and Methods

The reporting error detection process includes different data sources and processing methods.

Reporting analysis remains one of the main methods of error detection. In the context of the development of digital technologies, high-tech techniques have increasingly been used to detect cases of information distortion in companies, which increase the organization's ability to effectively and efficiently combat fraud. This includes technologies such as digital forensics, robotics, blockchain and the collection of online evidence.

Research on ways to detect errors in financial reporting was carried out on the basis of the application of general scientific methods of research in the framework of statistical analysis, analysis of the structure and dynamics of reporting data, methods of financial analysis. The empirical basis was the data of financial statements of cooperative organizations in Europe and Russia.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers

as Hallas (2019), Kryatova et al. (2021), Sherman (2020), Veselovsky et al. (2015), Danilova and Levanova (2020), Darinskaya (2017) and Mikhailenko (2013).

3 Results

The research conducted by Audit Analytics in 2018 on the reporting indicators of various companies for 18 years showed that in just 2018, 65 large companies, including General Electric, Seneca Foods, Carillion, Camping World Holdings, found sufficiently serious accounting errors to conduct a full recount and resubmission of relevant financial reports to regulatory authorities. Thus, in addition to the losses associated with correcting errors in the financial statements, these companies also lost time and performance due to labor-intensive fixes (Banham 2019).

A survey conducted by BlackLine among customers showed that inaccurate data affect not only the company's financial report. 41% of respondents indicated that errors in reporting negatively affect the ability of companies to raise capital, which reduces their growth prospects; 40% said it increases their debt levels; 42% predicted significant damage to reputation.

What begins with a small mistake can have serious consequences. Financial reporting errors affect everything from the reputation of the company to its ability to raise capital, and can even cause a drop in the price of shares, as shareholders lose confidence in the ability of the organization to compile accurate reports. Errors can prevent creditors from financing critical projects or cause disagreement over a potential merger or takeover.

Given that automated accounting systems often manage daily business activities; one might think that there are few errors in financial data. However, a survey of more than 1100 senior executives and financial professionals conducted by software provider BlackLine and independent research firm Censuswide suggests otherwise.

The survey shows a wide gap of opinion on the accuracy of data among financial professionals and senior managers. Among top management members, 71% expressed full confidence in the accuracy of financial data. Among the financial specialists—a group consisting of financial controllers, accountants, analysts and internal auditors who prepare financial statements and reports—only 38% spoke about the reliability of the data (AS2110).

This gap should be of concern to investors, employees and business partners, especially CEOs and CFOs, who should confirm the accuracy of the financial statements of a public entity.

4 Discussion

Although each company faces its own problems in accounting, many have similar reasons for errors in the financial reporting process:

- **Absence and/or inconsistency in data**. This is facilitated by the absence of comprehensive comparative data for previous reporting periods in the financial reports; Incomplete information included in the reporting. Reporting prior-year amounts, prior-month amounts, or budgeted amounts makes it easier for the user to determine whether current waiting amounts exceed or do not match them.
- **Financial statements do not reflect reality**. Manual accounting often distorts financial data to maintain balance in the books. Automation of accounting and control processes stops this in the bud. Because all transaction data is automatically collected, systematized, and fully visible, this significantly reduces the possibility of fraud or data entry errors. In addition, many small business accountants have insufficient qualifications in interpreting accounting principles and, in particular, recognizing income and expenses. This situation leads to inaccurate financial reporting, which in turn results in management potentially making important financial decisions based on the data contained in these inaccurate reports. The full audit trail provides the CFO with clear charts and charts of asset, capital, and liability movements, as well as full and summary financial reports on request to industry and government auditors.
- **Failure to review procedures to avoid repetition of inconsistencies**. Often, companies that identify an error or mismatch properly spend time adjusting or correcting the books, but then cannot implement or revise their accounting procedures to prevent the error or mismatch from happening again.
- **Insufficient forecasting of cash flows**. Cash flow is the source of life force of any company (and its existence as a whole). A firm and complete understanding of historical, current and projected cash flows is necessary to manage capital investments, fund expansion, upgrades or other large-scale expenditures, as well as to conclude favorable working capital financing conditions when forecasts reveal potential shortfalls. Without monthly cash flow statements, periodic and annual profit and loss statements and projected cash flows, the company exposes itself to unnecessary risk of cash-unsecured transactions.
- **Procedural inefficiency**. In addition to eliminating the most obvious errors, omissions, and inconsistencies in business processes, comprehensive information on business process KPIs facilitates further improvement. The solution to this problem can again be carried out by completely automating not only accounting operations, but the whole business as a whole. But in addition to human error, the company's financial and accounting system cannot always easily connect to all other IT systems in the business. When closing books for reporting purposes, it is difficult to verify the accuracy of financial data in all these systems. It is also worth taking into account the fact that as companies acquire other firms, they usually inherit various IT systems that cannot interact with their systems and rarely become fully integrated into business processes. Hereout the occurrence of many errors in data consolidation.

While players in the market track the company's value and performance, regulators monitor compliance with generally accepted accounting principles (GAAP, IAS, IFRS). Accounting and finance departments are under great pressure to provide

information that meets all user groups while minimizing costs. This can cause problems in the preparation and presentation of financial statements from recognition of income and expenditure to misjudgment of assets, lack or insufficient disclosure of data and other errors.

As regulatory requirements develop, companies need to understand new rules, requirements and deadlines to ensure compliance with accounting and reporting principles. Management decisions require complex judgments. Many companies have to make decisions at the same time, for example, on how to pay and take into account R&D and when to recognize revenue in a long-term service contract. Worse still, judgments may be based on data that may be inaccurate.

One solution to reducing reporting errors is for enterprise risk management, financial planning, and analysis directors to coordinate efforts to strengthen collection, processing, modelling, and reporting. ERM executives control the management of strategic and operational risks at the enterprise, while FP&A executives analyze financial indicators, such as sales and expenses, for forecasting and budget requirements (DelVecchio 2019).

Companies must also change their audit firm every few years in order to occasionally check accounting with a "fresh perspective".

For many companies experiencing digital data transformation, this is the right moment to rethink how their financial data is processed. Assuming that the company develops fully digitized business processes, they should be able to conduct 100% verification of the accuracy of accounting processes. Software that fully automates business processes will help ensure the transparency of financial data across the organization. However, to interpret data, make further tactical and strategic management decisions, you still need smart people who understand the principles of accounting.

5 Conclusion

Incorrect financial reporting is a common difficulty for accounting and financial services in companies of all sizes. Typical reasons for adjusting financial statements range from innocent human errors and erroneous application of accounting principles to intentional accounting fraud.

In accounting, there are a huge number of judgments, some of which are based on the experience of people, and some on their views on a specific problem.

Despite the risk of potential market backlash, government investigations, enforcement measures, including civil and criminal sanctions, many companies continue to struggle to provide comparable and reliable financial reports.

Inadequate processes, malfunctioning systems and human factors—addressing these deficiencies and harmonizing them for holistic functioning can prevent errors and their painful consequences.

In an era of new and evolving technologies and modern accounting models, many errors can be systematically avoided. With the widespread adoption of fast, adaptable,

efficient, and customizable technology solutions, it is no longer necessary to manually extract data from multiple sources using legacy technologies.

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Assessment of the Economic Potential of Entrepreneurship and Modern Consumer Cooperation in the Modern Economy

Olga A. Repushevskaya

Abstract The relevance of the topic is argued by the fact that before the pandemic, entrepreneurs dominated the market, whose main goal is to make a profit, they just partially displaced the consumer community from the market. The economic situation in 2020 showed that only the joint work of entrepreneurship and consumer cooperation will allow solving the issues of the economy reaching the planned indicators. The potential of consumer cooperation in the economy is formed due to entrepreneurial activity, and in particular, providing employment and increasing incomes of the rural population, attracting agricultural products, raw materials and wild plants into economic circulation, producing goods and services with a subsequent transition to the sphere of consumption, meeting consumer needs, forming parts of their profitability. Modern consumer cooperation in Russia is based primarily on consumer associations and their unions, scientific and educational institutions of the Central region of the Russian Federation, as well as on cooperative organizations of republics, regions, etc. In order for entrepreneurship to successfully carry out its activities, it needs government support and consistent economic policy, so that the business is competitive and able to meet the needs of people whose needs are changing in difficult economic, political and other conditions.

Keywords Entrepreneurship · Comprehensive assessment · Economic potential · Potential level · National market · Cooperation · Consumer activity · Competitiveness

JEL Codes Q1 · R1 · R2 · R3 · R5

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1 Introduction

1.1 The Changes Taking Place in the Markets in the Russian Economy Lead to a Radical Restructuring of Economic Mechanisms

Now the following economic problems such as, realization of production for business, in spheres (food; essentials; medicines; building materials) are resolved with the purpose to minimize the expenses; the main thing is search of sales markets. For this purpose, they need to provide giving in shops of organic vegetables directly from beds, and to deliver meat products to the consumer in 2–3 h after a face.

Modern consumer cooperation in Russia is based generally on consumer societies and their unions, scientific and educational institutions of Central federal district of the Russian Federation and also the cooperative organizations of the republic, areas and regions.

Consumer cooperation is the market of the country which connects the union with the consumer organizations having the right of a message business activity (trade, public catering, agriculture, procuring, production, etc.). Consumer cooperation (further—the personal computer) is the system of social orientation of market economy.

It is important to adjust their interrelation for joint cooperation and to find ways way out of the developed economic situation in Russia.

Relevant decisions today, I can become sale of products online in shops with the organization of home delivery, taking into account the pre-order. It is also necessary to improve a logistic business chain of selling of the products. Questions of logistic decisions can be seen in modern consumer cooperation.

2 Methods of Research

The theoretical and methodological basis of the research was the established scientific methods, the works of Russian scientists, and the recommendations of research institutions on this topic. Innovative approaches were used in forecasting development directions. In preparing the article, statistical materials of the Ministry of Agriculture of Russia, the Republic of Tatarstan and other open publications were used.

3 Results

As a result of the research on the assessment of the economic potential of entrepreneurship and modern consumer cooperation in the modern economy, the

relationship in cooperation between entrepreneurship and consumer cooperation was revealed and revealed as the basis for the exit of the Russian economy to the planned indicators. It is proposed to update the joint work, build the supply chain from production to implementation, in order to minimize costs.

4 Discussion

At present, Russia, like all countries, faced a decline in economic activity, employment and incomes, which led to limited resources for economic recovery and restructuring. According to forecasts for 2020, there is a decrease in GDP by 4.2%. That meant losing the results of two years of previous growth, which was already quite modest (1.5–2% per year without taking into account one-time factors).

The decline in export earnings, as well as the sharp contraction in trade (especially rose), services and a number of other sectors, had affected the incomes of the general population, threatening not only economic dynamics but also social stability. At the same time, the scarcity of domestic demand and available financial resources, as well as uncertainty about the development of the pandemic and other external factors, limited the possibility of restoring entrepreneurial and investment activity (Fig. 1).

In the modern economy of Russia, it is necessary to distinguish two main crises that directly affect the general economic situation and the standard of living of the population.

The first crisis was anti-Russian sanctions, which were introduced due to the accession of Crimea to the Russian Federation, as well as restrictive measures that

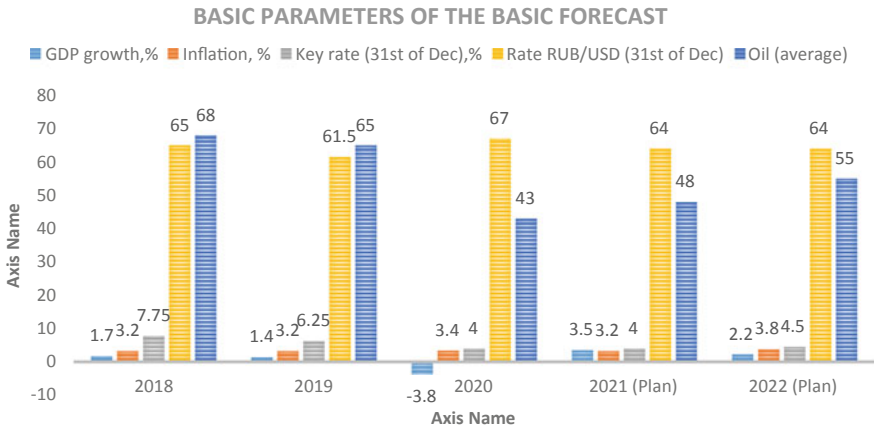

Fig. 1 The main economic forecast indicators in Russia for 2018–2020, planned 2021–2022, in %. *Source* Federal State Statistics Service (2020)

Table 1 Vectors of activity of consumer cooperation of the Central Union of Russia, in%

Federal districts	Retail trade	Purchase of agricultural products	Services to the public	Public catering	Wholesale trade	Other work
Central Union of the Russian Federation	61.5	11.9	11.8	6.6	4.47	3.8
Central	67.4	9.2	7.3	5.9	6.61	3.6
Northwest	68.1	6.0	11.5	5.3	5.64	3.5
Volga	56.5	17.0	12.3	7.5	4.20	2.6
Ural	62.6	8.1	8.3	8.8	5.29	6.8
Siberian	66.3	10.6	10.4	5.3	2.04	5.3
Far East	64.2	4.5	12.4	7.0	3.97	8.0

Source Ministry of Economic Development: On the current situation in the economy of the Russian Federation in the first half of 2020

subsequently arose in the East of Ukraine. During this period, the economy lost $20–25 billion.

However, in Russia, an import substitution mechanism was launched, which ultimately turned out to be the most significant tool during the sanctions. Thanks to this, Russian suppliers were in a dominant role, since they had great power in the market. Conditions were provided by the state to ensure import substitution and food independence.

The active participation of the consumer cooperation system played a significant role in this issue (Table 1).

Trading activity is the main activity of the co-temporary consumer cooperation. Organizations that were an integral part of consumer cooperation were now at the forefront of capacity development. On the other hand, they have distinctive features that are important to take into account during the period of operation in the areas of trade development in consumer cooperation.

The logistics system, which was an important part of the consumer management system, operated in various enterprises, from cooperative to private. Past that, the system facilitated the supply of products from cooperators through State contracts.

The procurement of products, including those of private enterprises, agricultural organizations and small associations, was the most important activity of organized consumer cooperation. This area of implementation of the kind of activity of the organization of consumer cooperation was of the greatest social importance.

The main goal of the development of the activities of consumer cooperation organizations is the formation of guaranteed sales. Providing data on the product to private enterprises and agricultural organizations is the most important need for the organization of consumer cooperation. The consumer trade cooperation of the industry was of the greatest social importance.

Unfortunately, the development of retail networks in the system of consumer cooperation is complicated by a significant level of competition in federal retail chains, as well as almost unlimited opportunities to attract additional resources and force consumer cooperation with the organization of their storage in all regional centers and in remote areas.

Therefore, potential consumers of cooperation are very well suited for the implementation of import substitution policies, which will lead Russia to increase the competitiveness of domestic goods.

The second crisis was the quarantine measures introduced by many countries in early 2020, which led to a significant decrease in business activity in the largest economies in the world.

The shutdown since 30th of March and other measures had led to a major economic downturn.

The biggest drop was the production meeting consumer demand. The volume of paid services provided to the population decreased in April and May by almost −40% YoY, retail trade turnover decreased by −22.6% YoY and −18.6% YoY co-responsibly (mainly due to trade in non-food products).

Thanks to the results of the research, it becomes clear that since mid-March, Russian entrepreneurs have experienced difficulties in doing business. Many no longer had hope for a possible improvement in what was happening. Entrepreneurs asked the State to provide support in the form of tax reductions and other measures. Soften the tax regime and provide other support measures. Representatives of small businesses suffered the most.

And, the role of SMEs in the global economy was recognized at the highest level: the UN General Assembly resolution in 2017 proclaimed June 27 as the Day of Micro, Small and Medium Enterprises, which was dedicated to increasing public awareness of the contribution of SMEs to the world economy and ensuring sustainable development, as well as raising awareness about the need to increase investment in small and medium-sized businesses in developing countries.

Shows which sectors of the Russian economy, and business areas suffered the most from the coronavirus spreading (Fig. 2).

85% of entrepreneurs indicated that the coronavirus spreading negatively affected the financial performance of their organization.

Figure 3 shows in % of all surveyed entrepreneurs about the financial condition.

The main goal of business is profit. For this purpose, it is necessary to resolve the following economic problems such as, realization of production for business in spheres (food; essentials; medicines; building materials), for the purpose of cost minimization, and the main thing search of sales markets.

Main objective of investments is profit. For this purpose, it is necessary to solve the following economic problems, such as process of production of business activity of the directions (food; necessary equipment; medicines; construction materials), for the purpose of cost minimization and, the most important, search of sales markets.

The State Duma started consideration of the federal budget for 2021 and plans for the period of 2022–2023. The President of Russia Vladimir Putin designated the main priorities of financing of social obligations of citizens and, of course, the

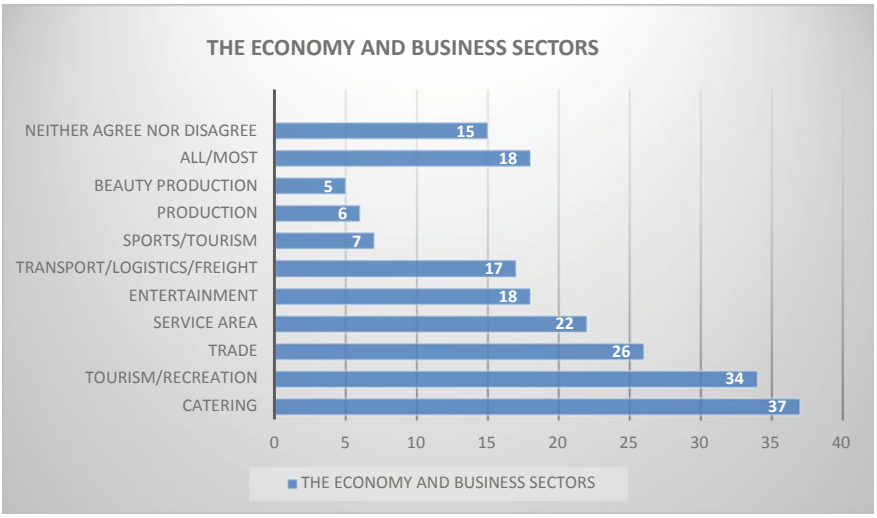

Fig. 2 Industries of the Russian economy and business sectors suffered the most from the coronavirus spreading, in %. *Source* Federal State Statistics Service (2020)

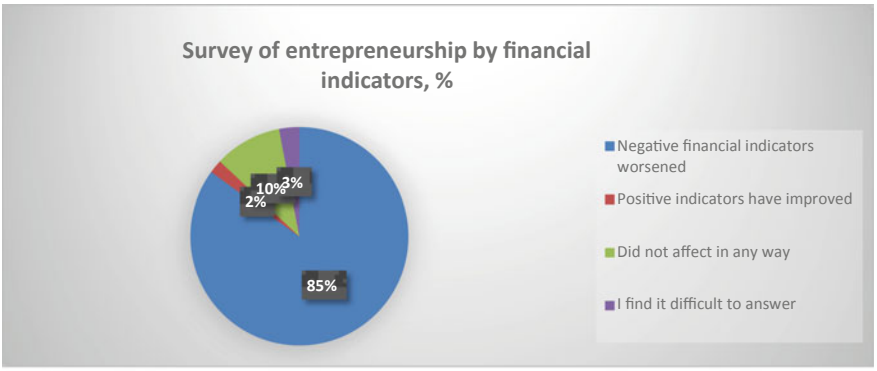

Fig. 3 Results of entrepreneurship survey from negative impact of coronavirus spreading and its influence on financial indicators of their organization in 2020, in %. *Source* Federal State Statistics Service (2020)

countries connected with tasks of advance forward, with success of the strategy implementation of national development put for the next decade here.

Now thanks to "social security and development" there is an opportunity as the president considers, to set the predominating tasks of consumer cooperation led by Centrosoyuz of the Russian Federation, the paramount purposes of development.

The main direction of implementation of the activity of Centrosoyuz of the Russian Federation is work on service of the population, formation of social and production

infrastructure, provision industrial and also food products, and of course, work with unemployment by means of small-scale production development.

Consumer cooperation in collaboration is capable to solve pressing problems in connection with location to branched infrastructure with public authorities of management.

Modern consumer cooperation in Russia is based generally on consumer societies and their unions, scientific and educational institutions of Central federal district of the Russian Federation and also the cooperative organizations of the republic, areas and regions.

Based on forecasts, 2021 will be a difficult test for entrepreneurship. Promising areas of its development in Russia include ideas aimed at the region where they will be implemented. This mainly applies to the areas of production:

- foodstuffs;
- essential goods;
- medicines;
- building materials (Nabiyeva 2021).

Today all categories of citizens aspire to a healthy lifestyle and for this reason every day demand for natural food grows. The idea of realization of production to small and medium business in these spheres, with the purpose to minimize the expenses, is—search of sales markets (Shamin et al. 2020). For this purpose businessmen need to provide giving in shops of organic vegetables directly from beds, and to deliver meat products to the consumer in 2–3 h after butchering.

One more relevant decision is sale of products online in shops with the organization of home delivery, taking into account the pre-order for today. It is also necessary to improve a logistic business chain of selling of the products. Questions of logistic decisions can be seen in modern consumer cooperation.

Modern consumer cooperation in Russia is based generally on consumer societies and their unions, scientific and educational institutions of Central federal district of the Russian Federation and also the cooperative organizations of the republic, areas and regions (Khoruzhy et al. 2018).

Consumer cooperation is the market in the country connecting the union with the consumer organizations which have permission to conduct business activity (trade, public catering, agriculture, preparation, production, etc.). Consumer cooperation (further—the personal computer) is the system of social orientation of market economy.

It is confirmed also by a main goal—a social mission of consumer cooperation. The country people—consumer cooperation which is created by the people and serve the people for satisfaction of his urgent needs, consumer cooperation promotes growth of welfare of the people, especially his most unsuccessful part, also it is the union of the consumer and society at various levels while the private organization was created for satisfaction of material and other needs of members of society (Shakhova et al. 2019).

On the basis of membership, through the unification of a consumer society—the creation of an association on a voluntary basis of an association of individuals

and (or) legal persons, its members, as a rule, create trade, supply, production and management bodies of state self-defense, and the heads of consumer shareholders reasonably and professionally interact in the structure of management of consumer societies and unions (Bessonova et al. 2021). The functions of management bodies indicate that shareholders make decisions on various issues of economic and social activity of a consumer company and its association. Consumer cooperation is actually a school of autonomy for active shareholders.

The revival of the cooperative movement occurs when the government has created favorable conditions for the development of cooperation, that is, during a period of intensive development of market relations in the country (Bank and Suglobov 2014).

In order for the cooperative to successfully implement activities, it is necessary to have state support and consistent economic policies in order for the enterprise to be competitive, as well as to be able to meet needs, given the fact that people's demand is undergoing changes in difficult economic, political and other conditions.

As a result of increasing demand for domestic agricultural products, the process of creating consumer cooperatives has recently begun to develop more intensively (Sekerin et al. 2019).

The main factors that cooperation should take into account during the formation of strategy:

1. GDP growth

Forecasts of economic growth for 2021–2022 are largely restorative. It is planned to increase GDP by 3–5% in 2021 and by 1.5–3.5% in 2022 (Federal State Statistics Service 2020) Work on GDP growth will continue and continue in the framework of the national programs of the Russian government.

It is planned to provide restoration work on the economy and domestic demand, it is planned to solve issues of easing monetary conditions at the expense of the monetary policy. Due to this, support will be provided for lending to the business, the growth rate of which will increase from 3–8% in 2020 to 6–11% in 2021–2022.

The slowdown in economic growth, more due to the unfavourable conditions of world financial and commodity markets, the deterioration of the investment climate, difficulties in attracting foreign financial resources, geopolitical factors, including credit, can have a negative impact on the state of participants in Russian financial markets, including consumer credit cooperatives.

2. Inflation

Resolving the issue of easing monetary policy will also lead to maintaining annual inflation of about 4% on the forecast horizon. As a result of falling domestic and external demand in 2020, it is quite difficult to contain inflation without additional events (Report on monetary policy of the Central Bank of the Russian Federation 2020).

For disinflationary influence, weak demand this year will compensate for the temporary lag of pro-inflationary processes—this is both the weakening of the ruble and the observed level of increased demand for certain categories of goods. Therefore,

inflation growth caused by these projects is estimated as temporary (Ryabova et al. 2020).

Lower inflation and interest rates contribute to macroeconomic and financial stability and provide opportunities for enterprises and people to expand their financial planning horizons.

3. Real incomes and savings of the population

The first half of 2020 proved difficult to assess the standard of living of the population and was aggravated by emergency measures that had a deterrent effect on the situation with the spread of coronavirus infection. This has led to the suspension of activities in many economic sectors. Event By the effort to support the incomes of the population, of course, had value, but the situation inevitably led to their reduction. In general, monetary incomes of the population decreased by 8% compared to the previous period of the current year (Veselovsky et al. 2016).

The analysis of the macrostructure of consumer spending in the population has noticeably changed. The end of the half-year showed a significant decrease in the share of expenses for the acquisition of goods and services at the means of growth of part of savings, as well as a slight decrease in part of mandatory payments. It is assumed that these changes are of a situational, temporary nature and are associated with forced suspensions of the economy (Ministry of Economic Development: On the current situation in the economy of the Russian Federation in the first half of 2020).

In connection with the above, the role in developing the potential of consumer cooperation for 2021 is significant.

If there is high competition, each company's market position should be strengthened. In order for the company to be in demand in the competition segment, it is necessary on an ongoing basis not only to preserve the benefits gained, but also to search for new ones. This statement plays a special role for the enterprise in the production complex system (Bessonova et al. 2018).

Now in Russia, the consumers of production complex services are the rural population and the population of small cities, since they especially need to meet the need for goods and services offered by the consumer cooperation.

The main activity of the Production Complex is trade, procurement, food and production. Trade is the most popular. It accrues 65% of activity against the backdrop of the entire mass. To effectively implement activities, the PC creates a room (transport and (or) warehouse, repairs equipment for improved productivity, performs banking services, trains personnel, etc.).

Nevertheless, the Production Complex could not resist and maintain previous position in the competitive environment due to the transition to market relations. Consumer cooperation lost profit and support from the country. The low payment capacity of the company in the 90s gave rise to a number of problems that to this day have not been solved: the number of enterprises engaged in trade has decreased, the methodology of productive management of the enterprise has lost, rental and sale of stores in busy flows, etc. (Rodionov et al. 2021).

In order to improve the positioning of consumer cooperation, it is necessary to increase their competitiveness, which can be done only if there is a competitive advantage (CP). Cooperative organizations need not only to meet the needs of consumers, but they must be leaders and outperform their competitors (Khoruzhy et al. 2018).

In the formation of socio-economic orientation in the Russian Federation, cooperation and entrepreneurship can play a significant role. This requires a strategy for the development of a coordinated state movement based on the following principles: maintaining cooperation is not an end in itself, a cooperative form of organizing cooperation and self-organization of the people to improve the socio-economic situation, in the event that society does not have the opportunity to solve the problems of its own life without interference, or without the support of the country, as well as in cases of primacy in the development strategies (Nabiyeva 2021).

It is worth remembering that cooperative and entrepreneurship will achieve favorable efficiency only when it unites people to solve important problems that are extremely difficult to solve, and therefore it is most difficult for the cooperative and entrepreneurial movement to find and solve these problems.

The coordination of the cooperative and entrepreneurial movement, its development strategy, ensuring the equitable distribution of vital resources, and promoting cooperation in organizing vital events that contribute to improving the standard of living of the population were analyzed.

One of the strategic directions for the development of cooperation and entrepreneurship is the use of a cooperative form to overcome the crisis of agricultural enterprises, on this basis the National Food Security and the general food problem are solved.

Therefore, the activities of cooperative organizations are (Orlova et al. 2020):

- Considering the subtleties in the sphere of territorial location, climate, culture, etc., there is coordination of Production complex work;
- Building a common strategy and development plan for PCs in conjunction with regions, taking into account economic and political conditions;
- Value positioning and protection of PCs by public authorities;
- Development of concepts and programs in the areas of the cooperative movement, identification of the most effective institutional and legal forms and promotion of structural adjustment and new investment policies;
- Improvement and development of cooperative organizations within the national region and economic ties between them;
- Support view of the cooperative movement in education and science;
- Training in the professional sphere of personnel through the network of educational institutions of production complexes by region;
- Opportunity to participate in programmes for the exchange of experience in various activities;
- Activities in the field of production complex development by regions and country (trade, production, procurement, construction, medicine, education, etc.);
- Participation in international innovation and scientific and technical cooperation in the field of international innovation and technology.

5 Conclusion

Therefore, the most important strategic factor in the sustainable development of the economy and ensuring a decent standard of living for the population was the formation of civilized modern relations between consumer cooperation and entrepreneurship in the economic space of Russia.

Entrepreneur and cooperation are the driving force of the market process, which perform main constructive functions.

The pre-pandemic market was dominated by entrepreneurs whose main goal was to make a profit; they just shifted partially from the consumer community market. The economic situation of 2020 showed that only the joint work of entrepreneurship and consumer cooperation will solve the issues of the economy reaching the planned indicators.

Therefore, if you take into consideration globalization process of economy of the world, the competitive environment between regions, the interregional competition and market asymmetry, improvement of aspects in the sphere of economy and policy in development of the country as social model of economic development, then it is possible to draw a conclusion that in common the personal computer and business will have beneficial effect on economy as she makes the contribution to the organization of the cooperative sector of economy that will promote development of sparsely populated areas.

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Sustainability of Consumer Cooperatives in the Context of Economic Security

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Abstract In the context of the development of digital and market instruments in the economy, the severity of the negative impact of the pandemic, the growth of competition in the field of entrepreneurship for business entities of the consumer cooperation system, the problem of sustainability of functioning and development is actualized through the application of economic security mechanisms. The economic security of the enterprise is dual in nature: on the one hand, it provides the possibility of its own functioning, on the other hand, it is part (element) of the economic security of the highest-level system and the entity performing functions by the region, the state. In such a way, in the system of consumer cooperation—a separate consumer society, ensuring the stability of development, countering threats to the external environment, forms the foundation for the development of the cooperative movement and the stability of the entire system. It is obvious that the processes taking place in the modern socio-economic environment in connection with changes in the economic system and its adaptation to modern conditions bring to the fore the problem of economic security, and that is why the issue of its importance for the sustainable development of economic entities of cooperation. Economic security should be considered not only at the state, region, industry level, but also at the enterprise level, since the latter plays a significant role, affecting the interests of society and the state. For example, enterprises of the consumer cooperation system that carry out economic activities at their own peril create jobs, meet the needs of both workers and consumers, that is, enterprises provide employment for the population. In addition, it is enterprises that pay taxes to budgets at all levels, thereby communicating with the state and society.

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1 Introduction

In the opinion of the authors of this article, stability and security are the most important characteristics of consumer cooperation as a single socio-economic system. They should not be contrasted.

Speaking about the development of the system of consumer cooperation, one cannot but note that sustainability cannot be beyond development. The system of consumer cooperation is dynamic, mobile and adaptive. The dynamics of the parameters of the external environment objectively leads to a change, to a greater or lesser extent, of approaches to the management of consumer cooperation enterprises, which makes it necessary to maintain the stability of the system itself, that is, the business entity. In this regard, an enterprise can be unstable and unstable during the course of transformations, and therefore be subjected to negative external influences, which determines the key importance of the use of tools to ensure its economic security. Obviously, the disruption of the proportions, that is, the main elements of the enterprise as a socio-economic system, and the relationships and interactions between the elements of this system leads to its destabilization. Such negative manifestations are critical signals of an increase in the dangerous state of the socio-economic system.

2 Methodology

The economic security of the economic entity today is the object of many studies, the result of which is the multidimensional nature of this concept. To understand the content of this term, we will summarize the existing ones, and highlight a number of approaches that reflect their specific contexts.

The first approach is called—resource approach and it is characterized by the ability of the business entity to effectively use the available resources, in conditions of their limitations, to ensure sustainability, competitiveness and reduce risks. We can include the research of Oleinikov (1997), Donbass (Lukashuk 2016) and others.

According to a number of researchers (Grunin and Grunin 2002), the activity of such an economic entity that is able to maximize the use of corporate resources can be considered economically safe. And the additional effect of the enterprise will be to prevent, weaken and protect itself from real and potential dangers and threats. Thus, the enterprise, ensuring its relative sustainability in the current period and in the future, based on the effective use of limited resources, creates the most favorable conditions for achieving strategic development goals. Yanigolo (2017),

agreeing with this point of view, believes that the effective use of the resources available to the enterprise is not possible without entrepreneurial opportunities and abilities characteristic of not everyone. It is entrepreneurial abilities and capabilities that determine the effectiveness of activities to prevent threats, the stable functioning of the enterprise and the achievement of its goals.

Therefore, this approach determines the primacy of the effective use of the resource potential of the enterprise, which ensures the sustainability of the business entity, and its counteraction to threats to the environment. That is, the formation of economic development potential, the use of progressive management tools ensures the safety of the enterprise in the field of management decision-making for the future.

Quite often, economic security is associated with the protection of the enterprise from external influence, from external and internal threats, destabilizing factors, risks and unwanted changes. We can say that such an opinion (Muratova 2012; Samochkin and Barakhov 2014; Melamedov 2002; Lizina and Guseva 2013; Bendikov 2000) prevails. The key arguments here are to ensure that all elements of the aggregate capacity of the enterprise are protected from both direct and indirect threats by responding flexibly to these negative dynamics (Belorusova and Rezkin 2013; Vechkanov 2007).

Therefore, the key in the content of the concept of "economic security" is the effectiveness of the relevant services of the enterprise in the field of threat prevention, and their ability to eliminate damage from negative environmental impacts. And the goal of ensuring economic security is to achieve stability of operation and the creation of opportunities for growth and development.

It should be noted that in recent years, in the field of analysis of the essence of the economic security of an enterprise, a so-called process approach has developed, characterizing, on the one hand, the dynamism of external changes characterized by constant, often extremely critical challenges, and, on the other hand, the development of the enterprise, which is a process of transition from one qualitative state to another, better. In this context, we are talking about economic security, as a process of ensuring its sustainable functioning in the present and development for the future, through the maximum effective use of available resources (Belorusova and Rezkin 2013).

The essence of the next approach—competitive approach, in our opinion, is that the economic security of the economic entity and the sustainability of its development are ensured by its competitive advantages. Manokhina (2014) believes that "the economic security of the company is the presence of competitive advantages due to the compliance of the material, financial, personnel, technical and technological potential and the organizational structure of the company with its strategic goals and objectives." A similar opinion is held by Belorusova and Rezkin (2013), who note that economic security is based not only on competitive advantages, but also on the very system of organization of the enterprise's activities, which forms, provides these competitive advantages.

3 Results

The analysis of different approaches to understanding the essence and content of economic security showed the multi-aspect nature and ambiguity of this concept. Nevertheless, the general provision in all these approaches can be considered that economic security itself is formed and determined both by the external environment and the internal environment of the enterprise itself, and is mediated and largely determined by the nature of the interaction of the enterprise with the external environment and the internal mechanism ensuring the effectiveness of this interaction. Obviously, both objective and subjective components must be taken into account in the process of interaction. And as a subjective component, in our opinion, is the degree of balance between the interests of the enterprise and the subjects of the external environment. In addition, when analyzing consumer cooperation enterprises, it is important to understand that the subjective component in many, if not all, reflects the very mission of consumer cooperation, which is embodied in the unity of interests of all participants in the consumer community. Therefore, it is important to balance not only the interests of the consumer society and the subjects of the external environment, but also the balance of the interests of its participants themselves.

Therefore, having analyzed the opinions of various authors, we will present our point of view on understanding the essence of economic security for consumer cooperation enterprises. By the economic security of a consumer cooperative enterprise, we will understand the process of ensuring the sustainable development of the enterprise, by effectively using the resource potential and competitive advantages of the cooperative system, in order to increase protection from dynamically changing external threats and realize its social mission. Let us clarify that despite the fact that we are talking about economic security, the implementation of the social mission of enterprises, due to the very purpose of the entire cooperative system, will be key.

The economic security of enterprises is traditionally considered as a combination of four components: organizational, legal, information and economic, presented in Table 1. We believe that this is not enough for enterprises of the system of consumer cooperation, because its social component is leveled, without which the system of the cooperative movement generally loses its meaning. And it is exactly what we added it to Table 1.

Modern practice proves that the sustainability of consumer cooperation in general and each individual consumer society, their effectiveness, is based on the trust and support of shareholders. Practice shows that it is such cooperative organizations that receive support from outside, in particular from state bodies, since they have a significant impact on solving the socio-economic problems of a particular locality and region.

Nevertheless, many organizations of consumer cooperation in market conditions occupy a special position, determined by dependence on natural factors, on seasonality of production, objectively less profitability and technical development compared to other industries, and for these reasons it is slower to adapt to changes in economic conditions. In this regard, for sustainable development, consumer enterprises need

Table 1 Components of economic security of consumer cooperation enterprise

Component of economic security	Component entity
Organizational	Preservation of the enterprise as a whole entity, ensuring its organizational integrity, as well as maintaining the normal functioning of the main divisions of the enterprise (departments, services, etc.)
Legal	Ensuring that the enterprise carries out activities in accordance with the current legislation, as well as ensuring the legality of actions of external partners collaborating with the enterprise
Information	Preserve internal confidential information from leakage or disclosure in various forms
Economic	Ensuring financial stability and sustained growth of key financial and economic indicators reflecting financial independence, business activity, profitability and sales growth
Social	Ensuring the material and social interests of shareholders, supplying goods, creating jobs, democracy, cooperation

Source Compiled by the authors

an appropriate market-based mechanism to ensure economic security as the basis for their sustainable development. The mechanism for managing the sustainability of a consumer cooperation enterprise includes the formation of the necessary number of resources to ensure economic activity, maintaining their volume and composition at a stable level, the use of modern methods and techniques of activity of a multidisciplinary consumer society with an orientation to the needs of shareholders and the external environment. The effectiveness of the mechanism for ensuring the sustainability of the activities of consumer society will form the necessary level of economic security, rationally using all its resources, ensuring normal financial stability, the necessary inflows of money for development and, thereby, meeting the needs of society.

One of the key tools available in the management arsenal of the consumer society is monitoring. The results of monitoring the implementation of the strategic plans of the enterprise make it possible to make the necessary adjustments in a timely manner, taking into account external risks, and emerging favorable opportunities for development and strengthening stability in the market.

In addition to monitoring the activities of the consumer cooperation enterprise, the following methods can be proposed to improve its economic security:

- to study and to analyze various legal acts relating to the operation of the enterprise and its spheres of activity with a view to identifying gaps and contradictions that may be used to undermine the economic security of the enterprise;
- to involve in cooperation with the enterprise of competent and reliable partners, partners, contractors;

- to study in depth the problems that may result in undermining the economic security of the enterprise;
- to carefully study the various innovative projects that the enterprise would like to implement before they are implemented;
- to forecast market trends, as well as the demand for the enterprise's products;
- to diversify the activities of the enterprise;
- to distribute possible risks of threat among persons interested in positive results of enterprise activity;
- to insure the risks of negative events; Provision for contingencies.

4 Conclusions

Using the proposed methods, the consumer cooperation enterprise will be able to develop sustainably on the basis of ensuring a high level of economic security.

Therefore, ensuring economic security is a progressive process of implementing a set of measures to prevent possible threats to economic activity and achieve the sustainability of the development of consumer cooperation in the future.

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Factors Hindering the Development of Agricultural Consumer Credit Cooperatives and Possible Solutions

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Abstract This article considers the main factors that inhibit the development of agricultural credit consumer cooperation and proposes ways to solve them. The development of cooperation in our country has a long history. Credit and loan savings partnerships provided real financial assistance to peasants. They saved the peasants from private banks and moneylenders, since they put them in bonded dependence. In order for the system of credit cooperation to develop successfully, state structures supported it in every way. Russian cooperative structures were comprehensively used in the distribution of loans, directly preferential, and state subsidies. For Russian independent farms today, the dominant position in the form of a source of small loans is only commercial banks. Significant assistance could be provided to enterprises in the agricultural sector, namely agricultural producers, the revival of the credit cooperative system. Assistance would come in the form of finding funds for farming, and could greatly facilitate the task of applying the experience of creating agricultural credit cooperation at the end of the past and the beginning of this century in Russia. There is an insufficiency in the current development of the legal framework in the development of credit cooperation and its contradictory nature. Amendments and adjustments are required in the Federal Law "On Agricultural Cooperation," as well as in the existing Federal Law "On the Development of Agriculture." A review would not prevent the Federal Target Program on the Sustainable Development of Rural Settlements, which was designed for implementation until 2020, as well as the possibility of its extension. The legal framework for agricultural credit cooperatives regarding their legal status and the general principles for self-regulation in financial markets should be reviewed. Here you can add a list of those target indicators that are designed to ensure the availability of financial services at retail. Currently, no program has been developed that includes a systematic approach and a science-based concept for the development of agricultural credit cooperation in our country, as well as including state support and regulation.

Keywords Credit cooperatives · Agricultural cooperatives · Cooperative members · Consumer cooperatives · Financial assistance

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1 Introduction

Activity of credit cooperatives is considered risky. And the matter for those cooperatives in which the population are invested is considered very relevant. There is a need for introduction of a control system behind the operations connected with financial activity and it is caused first of all by protection of interests of investors—members of these cooperatives and for financial stability.

If the organizations in the system of cooperation don't observe the economic standards recommended to them in the activity, then it leads to considerable reduction of the liquidity as during a crisis situation the members of agricultural credit consumer cooperatives can take away ahead of schedule the monetary investments. It is also one of deterrents in development. It is possible to refer weak development of a system of insurance in their activity to such factors, guaranteeing and reservation of agricultural credit consumer cooperatives.

2 Materials and Methods

Agricultural credit cooperatives may not apply existing standards of economic activity. They're not mandatory for them. The Federal Law No. 193-FZ "On Agricultural Cooperation" states that… "the charter of the credit cooperative or the decisions of the general meeting of members of the credit cooperative establish the standards of its financial activity and restrictions on the ratios:

1. the size of the mutual and reserve funds;
2. equity of the credit cooperative and its balance sheet assets;
3. the balance sheet assets of the credit cooperative and its current liabilities;
4. the maximum amount of the loan issued to one borrower and the assets of the credit cooperative;
5. the amount of the temporary free balance of the mutual financial assistance fund, which cannot be more than 50% of the fund" (art. 40.1, para. 9).

At present, as practice shows, the development of credit cooperation in rural areas is at the stage of formation, and a number of factors hinder the development and formation of this type of cooperation. Moreover, the problems of ensuring the stability and sustainability of credit policy in agriculture increased as interest in farming, agricultural companies and people leading personal subsidiary farms appeared.

The successful development of rural credit cooperation is facilitated by a competent cooperative policy on the part of state authorities.

This study is based on works such as Bobileva (2015).

From this we can conclude that there is an undeniable need for cooperation between the state and business. At the same time, the development of effective tools based on the analysis of domestic and world practice becomes a special method.

Currently, the Federal Law "On Agricultural Cooperation" is assigned to regulate the activities of agricultural credit consumer cooperatives. But the value of the established standards is not stipulated in the law.

From this we can conclude that this rule is a recommendation for agricultural credit cooperatives.

More strictly, financial standards are formulated in the Law "On Credit Cooperation" No. 190-FZ of 19.07.2009.

The question arises—do not all credit cooperatives use the same standards?

At the moment, significant changes require legal regulation of economic standards.

Granting the right to credit cooperatives to independently establish important relationships in the charter can be regarded as a positive step.

Let's try to consistently consider each of the recommended standards.

3 Results

1. The minimum amount of the mutual fund should be at least 1 (one) million rubles after the expiration of two years of the cooperative.
2. The numerical value of the standard of adequacy of own funds (the ratio of own funds and the amount of assets of a credit cooperative) should not be less than 0.12. Is it possible? According to our calculations, more than a third of the most successful cooperatives from the Rural Credit Cooperation Development Fund rating with assets exceeding 5 million rubles are unable to fulfill the standard.

However, according to the results of the research, the share of such cooperatives in the total number of cooperatives is no more than 8% (the average amount of mutual contributions of which is 928,000 rubles) due to the fact that the return of bank funds is very small, this program is most likely curtailed (according to the Russian Agricultural Bank).

Of course, they plan to consolidate this standard, but before doing this, it is necessary to calculate possible problems with the accumulation of starting capital that may arise as a result of its introduction.

However, if you are guided by article 34 of the law "On Agricultural Cooperation," then the credit cooperative in charter should fix the maximum amount of the loan. Shareholder savings are debt obligations similar to bank loans.

3. The largest amount allowed to attract from cooperative members should not exceed five percent of the mutual financial assistance fund.

A detailed analysis of the law "On Agricultural Cooperation" showed that it does not contain information on the maximum share of shareholders in the financial mutual assistance fund. However, the requested information can be found in the Law "On

Credit Cooperation," which states that each shareholder has the right to participate in the general share fund in an amount not exceeding one fifth of its value.

According to experts with rich practical experience in the field of cooperative management, this measure is justified, because if the loan amount of a member of the cooperative is too large, then it can have negative consequences. Therefore, if the shareholder decides to withdraw funds, the cooperative may be in an uncomfortable state. However, you can look at this situation from the other side. In the village, situations with a lack of free financial resources are not uncommon. In this case, the existence of a ban on borrowing more than a certain share may negatively affect the activities of the cooperative. If we turn to history, then at the dawn of the formation of cooperatives, various patrons, who most often became landowners, pastors (Raiffeisen, the Luginin brothers, Vasilchikov) provided financial resources for a long time. We can say that these resources were a kind of seed capital. Patrons did not require a fee for the capital provided. When the development of the cooperative reached a certain level, patrons received funds back.

This ratio is not advisable to regulate at the state level. Cooperatives, based on their circumstances, must independently determine priorities, which is more important for them: get the maximum financial resources or ensure financial independence. Some advanced cooperatives have already understood this and, to the extent of authority, take the most appropriate ratios for the implementation of activities. This is undoubtedly a positive experience, and other cooperatives should take it into their own hands. Legislators, in turn, should give cooperatives the right to choose independently, since there were many cases when ill-conceived laws violated the balance, one hundred led to deplorable results.

The use of the ratio of the maximum value of the savings loan to the size of the mutual financial assistance fund as a basis for the norm is not entirely correct for a number of reasons. In this case, it is better to use the amount of funds raised from shareholders in the denominator.

Consider what rules should be followed when forming a mutual financial assistance fund:

- funds that belong to Agricultural credit consumer cooperatives may not be allocated to the fund in full. This is due to the need to find financial resources for the return of savings.
- the savings of shareholder members should be transferred to the financial mutual assistance fund in full. Also, loans from shareholders, associate members of the cooperative, loans from credit and others should go there.

We need to note that the practice of applying cash loans is almost universally used. Financial relations in a credit cooperative are regulated in paragraphs of the charter. The charter also defines the scope and procedure for the formation, the practice of distributing a general fund for mutual financial assistance. Decisions are also made that determine the further development policy based on the results of the voting of the founders of the credit cooperative. This provision is regulated by article 40.1, with the mentioned paragraph 3 mainly by the Federal Law "On Agricultural Cooperation."

If the amount of free funds is revealed in the fund, it will be sent to the general mutual assistance fund of the cooperative on loan terms by decision of the regulatory body, namely the meeting of founders. Another way to spend these funds is to invest in government securities.

4. The long-term development strategy is the guarantor of the sustainable and prosperous development of the micro-financial instruments market. According to experts, it is necessary to actively intervene in this area also state structures. As for the methods and forms of government regulation in the field of the micro-financial market, their absence negatively affects the future prospects and opportunities for development and formation. Experts consider an important stage in the formation of effective credit cooperation to be propaganda, the development of a concept and programs for the development of territories.
5. Training for cooperatives. Their training, motivation, assessment and certification. Issues of the organization and production activities of cooperatives are also very popular.
6. A well-founded process of constructing a teaching and methodological complex of teaching materials of a methodological orientation for the development of agricultural credit consumer cooperatives.

4 Discussion

Despite this, we have areas that have proven the effectiveness of agricultural credit consumer cooperatives. This is the Lipetsk region. The most significant contribution to the development of cooperation in the field is the non-profit microfinance structure. The title reflects the content of activities, namely, the "Lipetsk Regional Fund for Support". This organization is an effective financial tool that contributes to the implementation of events for the sustainable development of agricultural cooperation in the Lipetsk region.

The technology of the Fund's interaction with cooperatives is carried out in the following stages.

Advice on the management of the Cooperative → legal and financial expertise, guidance → financing, monitoring, support → participation in the management of the Cooperative through associate membership. The fund provides up to 19 types of loans.

The Cooperative Development Centre provides the following services:

1. Consulting on the management of the Cooperative, as well as in the area of law and accounting, accounted for more than 6000 consolations. To date, widespread meetings have been organized with the leaders of municipal settlements in the villages, meetings with heads of peasant farming. Consideration of current problems and their solutions with the management persons of the main regional centers providing continuous work in the field of public relations. Workshops were also organized with the heads of regional information

and consulting centers and business incubators. The officials who are working in social protection and in the modern multipurpose centers and also actively cooperating with the center of development of cooperatives. The center has a website: lcrk.ru

2. Methodological work, modeling of cooperatives, study, generalization and dissemination of the best experience (Summarized experience of agricultural credit consumer cooperative Petrovsky and Luck, ACS Natalie, published brochures "How to create an agricultural supply consumer cooperative and an agricultural livestock cooperative without a slaughter workshop").
3. Training, organization, as well as retraining of employees and shareholders for agricultural credit consumer cooperatives (650 specialists underwent retraining).
4. Professional orientation of young people, students and school students (In total, about a thousand school students and students participated in the seminars).

5 Conclusion

The current macro and microeconomic component of rural territories, small settlements, individual agrarian areas, distance from large cities, the steady outflow of population to large urban agglomerations does not allow creating an acceptable quality of life for the rural population, stable and high income and wage levels. These objective factors affect the relevant economic conditions of the rural population and, in turn, the birth, spread and sustainable development of the agricultural credit consumer cooperatives.

In the modern Russian market of agricultural producers, large agricultural holdings work successfully, which have well-established chains for selling products to large retail chains, excellent personnel potential, the most modern digital management systems, administrative resources, both at the level of the leadership of the regions and the subject of the federation, and at the federal level. For their projects, banks give them a loan at a more favorable interest rate.

Small and medium-sized cooperatives and farms have much more modest opportunities in markets, in digital management systems, in personnel and administrative resources, in the possibility of obtaining cheap credit. At the same time, they are often remote from large urban agglomerations and often already perform a social function in the regions of presence and work.

In this regard, a good financial support system for small and medium-sized agricultural cooperatives will be the further development of a system of specialized credit institutions—agricultural credit consumer cooperatives, which will help solve the issue of accessibility and cheapness of credit.

In the modern history of Russia of the XX century, the experience of agricultural credit consumer cooperatives was subjected to a strong devaluation and transformation along with the logic of the development of historical events in our country, the

movement from capitalism to communism and vice versa, as a result, the system was almost completely destroyed.

Today, we need a new driver for the development of this system based on the most modern information and digital technologies, digital platforms that states can provide, as part of the program for the deployment of a system of state information systems and digital platforms.

A study by the authors of factors inhibiting the development of SKPK revealed that an important obstacle to the development of agricultural credit consumer cooperatives is: a low legal culture, in some cases insufficient financial literacy, a lack of a vision of prospects, a lack of competence in the field of uniting people, shareholders, cooperatives to solve pressing problems of finding financial resources for the development of small and medium-sized farms and cooperatives in remote rural areas. In order to overcome these obstacles, a set of informational events by, inter alia, state authorities on the ground is needed to create positive motivation.

Another important obstacle is the lack of a single digital platform for cooperative and agricultural production cooperative, which could lead to an electronic form of interaction between shareholders, cooperatives, consumers of the products of cooperatives (trade networks), including leading to electronic agricultural credit cooperation. This requires government support for the deployment of digital infrastructure in the form of a digital platform for agricultural production cooperative and agricultural credit consumer cooperatives.

Along with the main problems listed above, we can also note the high tax burden, the abolition of the UTII at the end of 2020, bureaucratization, high regulation of the activities of the agricultural credit consumer cooperatives of the Central Bank of the Russian Federation, but in general, the issue of reaching the sustainable development of the agricultural credit consumer cooperatives on the sustainable development model will depend on the state of agricultural consumer cooperation as a whole.

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Cooperative Education: Challenges, Problems, Potential

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Abstract The purpose of this research is to reveal the nature, directions and tasks of cooperative education, to consider the problems, potential opportunities and its key elements in different age groups and different national conditions. It is particularly important to identify the contribution of cooperative higher education to solving the most important socio-economic problems of our time. Cooperatives are credited with the ability to solve many problems, and their future is linked to solving market problems, or they are claimed to contribute to structural change. Another argument is that a pluralistic economy is sustainable in times of recent crises, and that cooperatives play an educational role for those involved in the functioning of civil society. Finally, there is the idea that cooperatives can be transformative, so they are able to gradually transform the economy into something similar to a cooperative community. Cooperatives do not exist everywhere and are not considered necessarily on the periphery of society: they are valued in many countries. The International Cooperative Alliance (ICA) and the International Labour Organization (ILO) (ILO and ICA, Cooperatives and the sustainable development goals: a contribution to the post-2015 development debate, joint paper, ILO and ICA, 2014) track their various types and record their contributions. This research attempts to understand the prospects and possibilities of cooperative education and its ability to bring about broader social change.

Keywords Cooperative education · Cooperative organizations

JEL Codes A13 · A20 · A21 · A22 · A23 · A29

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1 Introduction

Cooperative education, which has a long history of over a hundred years, was created by the cooperative movement and, in turn, provided support for this movement (International Co-operative Alliance 1995/2012; International Co-operative Alliance 2011; ILO 2002; Woodin and Shaw 2019). Such are, for example, the Moscow Cooperative Institute and the Cooperative College in Manchester (International Labour Organization 2001; Sobolev 2018). Both institutions, which recently celebrated their centenary, are affiliated with cooperative organizations. A unique historical experience was left behind by the Russian Institute of Agricultural Cooperation in Prague, which operated among the Russian emigration in the 1920s. Can such cooperative forms of organizations solve the key socio-economic problems of our time in different parts of the world?

It is important to understand what problems need to be addressed and what opportunities cooperative higher education has in order to provide the necessary information and promote the education of young people and adults. Moreover, the point is that such actions take place not only within the framework of the cooperative movement, but also in a wider social range.

Cooperative education has always been part of the cooperative movement, promoted the development of cooperation, involved people in this process, stimulated innovation and change. However, cooperative education is still receiving less attention than it deserves, and we need to think carefully about what type of higher education is necessary for the future, as well as how to create a different type of university.

In other words, the renewed cooperative higher education simultaneously interacts with the cooperative movement and at the same time explores and thinks about the future of society, employment and various types of work, as well as the future organizational structures and tools needed to conduct such activities.

2 Methodology

The research method is the analysis of thematic literature and research developments, focused on the formation of a better understanding of what constitutes and can constitute cooperative education, both in the European Union and in Russia (Goodson 2008; Kalmi 2007; Macpherson and Emmanuel 2007; Sobolev 2017; Sobolev and Pakhomov 2020).

The research proceeds from an area that cooperatives need to implement one of the basic principles of the International Cooperative Alliance—education, training and information in order to be successful. The purpose of this research is not to conduct a “performance assessment”, but rather to analyze various aspects of cooperative education, to clarify their potential and to offer ideas for better democratic governance (International Cooperative Alliance 1995; Cooperatives Europe 2016).

The research is essentially qualitative in nature, and it is based on the use of the method of analysis of articles and other publications that transfer experience and knowledge in existing cooperatives and in the field of cooperative education.

3 Results

Members in cooperatives are considered a huge human resource for solving fundamental problems of the future (for example, climate change), but how to use it is not always clear. Members are often passive everywhere and their connection with cooperatives is very weak. However, it is membership that gives the chance to educate people, especially as adults. It can become a lifelong education, and the prospects of these people are only expanding. For example, membership in consumer, housing and renewable energy cooperatives in Germany raises the environmental awareness of members. Membership and expansion of horizons also contributes to the process of human solidarity (ICA 2011; Cooperatives Europe 2016; Parnell 2001).

However, people who work in cooperative organizations often do not really know about the values and principles, but there are also people (especially ideologically minded) who try to create cooperatives in the hope of their social values. Therefore, cooperative education is, in fact, a process of creating a cooperative nature. This problem must be tackled in a fundamental way. There is a significant ongoing lack of knowledge about cooperatives and a lack of knowledge on how to create a cooperative that is both effective and reinforced by the values of cooperatives. Co-operative organizations are closely linked to active member participation and socio-economic change, so the fundamental problems of our society (political and economic democracy; increased welfare, injustice; exploitation; inequality) must all be part of everyday education. The question must be posed precisely this way: how can we change education and what needs to be done to recognize cooperative initiatives as part of the wider cultural basis of our societies (Woodin and Shaw 2019).

The Russian Institute of Agricultural Cooperation in Prague demonstrated a unique example of the unification of the Russian emigration and the training of young people in cooperative sciences. An interesting historical experience of working with foreign trainees-cooperators and countries of Africa, Asia and Latin America at the Moscow Cooperative Institute in the second half of the twentieth century.

However, there is currently a threat to the idea of development—one of the strong ideas that allows people to think about good prospects and a better future. COVID-19 and climate change challenge a “bright” future.

It can be assumed that the Sustainable Development Goals defined by the UN until 2030, as well as the concept of sustainable development based on both a market economy and interventions aimed at achieving social goals, will be unfulfilled (European Union Statement 2017).

UNICEF has warned of the emergence of “lost generation” children due to the coronavirus pandemic affecting education, nutrition and health. Disruptions in the

provision of basic services (including educational services) and rising levels of poverty pose the greatest threat to children. The longer the crisis holds its ground, the deeper its impact on children's education, nutrition and general health.

It should be noted that there are obvious problems between three aspects of cooperative education:

- values and principles are applied in cooperative practice, and this affects and determines a special approach to education, which is focused on democratic governance, must take into account the nature of cooperative interaction, the responsibility of members, etc.;
- in the case when the cooperative movement is large-scale, the variety of cooperatives is significant, as well as their goals, then such requirements are put forward for such an education that provide an understanding of cooperative models;
- successful management of a cooperative requires skills, especially in places where there are independent cooperatives, and their management does without state control and support.

It is worth noting that the state can play a significant role in the development of cooperatives through regulation and policies to encourage them, as well as by creating bridges between cooperatives and markets. This last aspect is especially important as many small cooperatives may not have been able to establish such market links.

Cooperatives have the potential to attract students and youth. However, a number of problems complicate its use. For example, rising high unemployment rates, together with the COVID-19 crisis and declining business activity, are almost everywhere. It is expected that over the next decade, the labor market will enter the labor market by one billion more than currently, but only 40% of them will be provided with jobs. Hence, it is important to understand the prospects and relationships between youth and youth, their opportunities. Cooperatives and cooperative education can help such people develop strategies and programs that meet the needs of employment, better meet their diverse life needs (Goodson 2008).

It is therefore important to consider how cooperative members are educated and trained in what it means to be a good cooperative: developing conceptual agreements, for example, about democracy (Schostak et al. 2012).

This should take into account both the strengths and the weaknesses of cooperatives. Their strength consists in:

- manifestation of stability
- risk aversion tendencies
- building trust
- providing members with economic benefits
- development of social capital
- uniting people with low incomes to give them greater socio-economic strength
- creating solidarity.

Weakness is indicated in what exists:

- regular bad experience
- excessive control and presence of the state
- insufficiently developed management skills (organizational, entrepreneurial, democratic)
- drift from democratic principles to command and control
- acquiring the characteristics of traditional enterprises.

Forming a cooperative may not be an automatic choice for low-income populations, but it may be the only option they have. It can also provide links to other cooperatives and forms of solidarity, as well as links to credit and productive resources and markets. At the same time, the formation of cooperatives may be conditioned by other factors and not reflect cooperative values and principles, but simply be considered as a mechanism for organizing people.

There is a problem of educational approach and content: if there is a dominant curriculum, what are the approaches to its sections? Apparently, the fundamental principles of cooperative education should be outlined. For example, include curricula that are relevant to those involved in the educational process and use an approach that allows them to engage and develop meanings related to their life experiences.

Another approach is to foster collaboration, allowing participants to take responsibility for developing a curriculum that matters to them and which is capable of creating knowledge that will be useful to many. Curriculum or subject areas relevant to specific individuals or groups can also be explored and revised.

It is important to highlight the distinctive feature of the cooperative university. If cooperative values and principles are laid down in the foundation of pedagogy and management, and people begin to relate to each other accordingly, this will have an impact on the curriculum. A student's experience at a co-operative university will be different from that of other universities because it will draw on co-operative history and co-operative values. Meanwhile, many universities claim that they are based on fairness, equality and fairness—a cooperative university should be different from them in some way. It is not enough for good teachers to know many of the values and principles of cooperation; a distinctive feature of a cooperative university would be to reflect on the significance of these values both for the educational institution itself and for those who study there (Shaw et al. 2011).

Another distinctive aspect is how cooperative values are embodied in university management. And how the values that guide the cooperative university will allow it to resist the commercialization of education, the transformation of education into a market institution.

It is important to include cooperatives in curricula, such as international development or business research programs, to open up a discussion about their various forms and the role and approaches of cooperative support organizations. Despite the fact that the lack of good textbooks on various aspects of cooperation (this applies to a lesser extent to historians) continues to be a serious problem, it is possible that the role of cooperatives in international development is determined not by theory, but by practice (Srnicek 2017; Laclau and Mouffe 1985/2001; Shaffer 1999).

Another aspect is the relationship between practical and strategic needs, where practical solutions to problems raise broader problems (for example, functioning housing cooperatives are a good reason for discussions about their role in society, about the cost of housing and the cost of paid or free social assistance).

4 Conclusion

This research examined the challenges faced by cooperative education. Cooperative organizations and the cooperative movement play an important role in education based on their long history. From a future perspective, it is important that cooperative organizations and the cooperative movement in general support cooperative education.

It is important to remember and reflect on the characteristics of cooperatives that distinguish them from other forms of entrepreneurship. Cooperatives are both sources of innovation and are themselves forms of social innovation, both in the past and in their new and changing forms and activities. Cooperatives in this respect are not residual or peripheral phenomena, their values and principles mean that cooperatives are not just an organizational form, but a way of thinking about the social and economic in our lives.

Therefore, it is important to think about what types of education and training are needed to support new initiatives, especially where new initiatives may not be called cooperatives but can be organized cooperatively. We need to think about what the learning needs are and how we might meet them in cooperative higher education. This conversation might center partly around a skill set, and maybe partly around ways of thinking, organizing, etc.

The big question is whether they can go beyond the areas of market and state failure by providing information on the different ways in which the economy and society will be organized in the future. This is why we must participate in cooperative education: build on past lessons, create new knowledge and propose ways to move forward in our serious and difficult times.

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Forecasted Budgeting Capabilities for Continuous Consumer Business Cooperation

Tatyana V. Bodrova, Natalia B. Morozova, Lydia V. Andreeva, Lyudmila A. Kryatova, and Vera V. Darinskaya

Abstract Budgeting provides accounting and analytical information to all managers; it stimulates and motivates both managers and employees to achieve their goal. The budget system should focus on assessing the financial position of the company. Due to the fact that consumer cooperation enterprises have a wide range of goods, works, services, the budgeting process is complicated and requires deep analytical detail. In order to solve the problem, budgets are proposed with indicative indicators that allow ensuring the continuity of consumer cooperation enterprises, becoming an instrument for influencing income, costs and profits. The strengthening of the accounting and analytical component is observed when making operational adjustments to budgets, which may be associated with a change in the assortment, types of work and services provided. Therefore, in the conditions of the pandemic in the spring of 2020, a number of activities were suspended indefinitely, in the fall the ban process repeated, uncertainty in the size of the spread of viral infection remains in 2021. In this regard, those enterprises that were able to establish and carry out permissible activities in the shortest possible time, revise budget systems, quickly control the entire resource base, reduce fixed costs, and take advantage of all types of state assistance turned out to be successful. Today, budget reporting should disclose not only the impact of the pandemic on cooperation, but also determine the period of entry into the planned growth rate of income, repayment of debt obligations, and answer the question of how many reporting periods it will take to recover.

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1 Introduction

In conditions of instability and uncertainty, especially with the emergence and increase of the COVID-19 pandemic, it is not enough to organize a marketing service, integration of economic ties with suppliers and contractors, buyers and customers to ensure the financial sustainability of the economic entity. Today, most organizations face a decline in consumer demand. Enterprises should therefore clearly understand how to use available financial resources to ensure business continuity. Revenues and expenses of economic entities are the main objects of accounting and taxation, determining the continuity of entrepreneurial activity. The information contained in the company's reports makes it possible to build a business development strategy and make management decisions aimed at its further sustainable development. Only high-quality information provided on time ensures the continuous viability of the enterprise.

Information generated in accounting and reported should be transparent, understandable, timely, rational. The accounting information generated in accounting meets all these requirements. The main difference between the information generated in accounting is its mandatory documentation, then systematization, using a double record and in-depth data detail, which ensures the reliability and significance of the accounting information.

Accounting information can ensure the normal functioning of the enterprise. Development of accounting on cost classification and behavior; cost accounting and costing methods and systems; improvement of automated methods of information processing allows using budgeting as a universal management tool, the tasks of which are to organize and optimize the entire business system, increase efficiency of cost control, ensure sustainable development of the enterprise.

2 Methodology

The term budgeting relates to the implementation of market relations. There is no single concept of budgeting in the economic literature (Karpova and Karpova 2015; Sheremet and Lyubimtseva 2015; Zubareva and Borisova 2019). Studies have shown that in foreign and Russian economic literature budgeting is considered in a narrow sense as a process of drawing up plans and estimates or in a broad sense as an enterprise management technology.

Common in the works (Golovetsky et al. 2019; Kachkova et al. 2019; Lobova et al. 2018; Romanova et al. 2018; Rykhtikova et al. 2018; Shinkareva et al. 2021) is the understanding that without budgeting it is impossible to effectively operate the enterprise. Budgeting is a technology that focuses on financial performance planning, cost–benefit accounting, and financial performance control. At the same time, budgeting provides managers of all levels with information on the implementation of planned indicators in the context of responsibility centers.

Although the budgeting system allows for the analysis of the use of budgets for effective management decisions, its introduction into the practice of consumer cooperatives is slow.

According to the website of the Central Union of Russia, today in Russia there are 2100 consumer societies that unite 4000 production workshops; 9000 objects for procurement, storage and primary processing of raw materials; about 33,000 retail retailers and 4000 catering companies. The system of consumer cooperation produces and sells goods, works and services to residents of 89,000 settlements of the Russian Federation. The total volume of activity under the system of the Central Union of the Russian Federation for 2018 amounted to 210 billion rubles (Central Union of the Russian Federation 2020). Further development of cooperation should be based on actual income and expenditure data in order to justify plans, cost and results projections for future periods, monitor the implementation of planned indicators and analyze deviations. No further planning and forecasting is possible without proper consideration of actual key figures. Budgeting can help.

Initially, it is very important to study the behavior of costs, since it is possible to correctly plan the movement of finances, resource bases, company assets, determine the criteria for the work of responsibility centers, and quickly make economically profitable management decisions based on a correct understanding of what costs and how (variables) depend (constant) on business activity.

The formation of the budget makes it possible to prematurely estimate the income and expenses of companies. Budgeting should ensure the interconnection of all structural departments in the company, promptly provide information to the centers of responsibility, motivate the team to achieve targets, evaluate the effectiveness of each employee, individual division and enterprise as a whole.

Using the budgeting methodology allows the enterprise to:

- quickly monitor all business processes;
- objectively evaluate and stimulate the work of the company, divisions and individual employees;
- effectively coordinate the work of responsibility centers and forces the management of structural departments to build work in accordance with the interests of the company.

In addition to traditional measures to find measures to increase the company's competitiveness, such as increasing the quality of manufactured products or increasing productivity, it is now of paramount importance to find areas of activity that can be carried out under quarantine restrictions, which emphasizes the need to establish a system for tracking emerging problems.

The sustainable development of business processes is impossible without a deep study of the management information system, which forms accounting and reporting information about the activities of the organization to meet the needs of interested users. Continuous improvement of methodological aspects of accounting activities in new difficult environmental and epidemiological conditions will ensure the continuity of entrepreneurial activity.

3 Results

In the context of digitalization of accounting information, the speed of transmission and processing of large amounts of information is significantly increased, transaction costs are reduced, intermediaries are excluded from business processes, direct interaction between the consumer and the supplier is ensured, which allows you to predict and model financial results on a single scientific and methodological basis, while respecting the interests of various user groups and increasing the financial stability of the economic entity.

The possibility of using modern Internet technologies for processing economic information allows you to obtain operational information. Making an effective management decision involves using not just information, but necessarily reliable information.

With the coronavirus pandemic disrupting business processes around the world, high-quality reporting at a time of great uncertainty is paramount. So, according to the Union of Consumer Cooperation Organizations, the turnover in the field of catering in 2020 decreased by 42%, which is due to a long period of downtime, and retail turnover decreased by 5% (Union of Consumer Cooperation Organizations of the Republic of Tatarstan 2020).

Studies have shown that today the role of budgeting as an information component of management as a whole is growing. It is important not only to own information, but also to group it correctly.

We propose to classify the purpose of budgeting according to the most important goals of consumer cooperation enterprises.

At different stages of business development, three main goals can be distinguished:

- a high rate of business development by increasing sales by more than 20% per year involves studying receivables, determining the size and conditions of lending, constantly checking the level of liquidity and solvency of the enterprise;
- a high level of profitability not less than 20% implies to correlate the level of profitability of the enterprise with the mid-industry, to form cost standards and quickly control their reduction, to identify the optimal size of sales, to study the ratio of income growth rates to expenses;
- maintaining a stable rate of business development, a rapid change in the value of the company, an increase or fall in equity capital involves studying the level of

profitability of assets, a market assessment of capitalization, a change in the level of capitalization, changes in retained income.

Depending on the goals, a budgeting system should be built, that is, the number and composition of indicators approved and controlled by the centers of responsibility.

Studies have shown that the execution of interval (maximum and minimum values) budget indicators simplifies the management and forecasting of future indicators.

For each company, different types of budgeting are allocated, some are formed constantly, others are rare, so high efficiency in the budgeting system can be achieved when working with a common budget.

Studies have shown that the role of the cooperative movement is increasing in order to minimize the costs of production and management, sustainability and continuity of business entities. Budgeting should play an important role in the work of consumer cooperation enterprises, help in optimizing costs, increase revenues and profits, and carry out and expand investment activities.

The budgeting process is the basis for improving the performance of the responsibility centres. Responsibility centers should receive timely information about decisions made by the management of the enterprise. Budget monitoring provides feedback between management and responsibility centers. Only with such work, in our opinion, will interaction of all departments and centers of responsibility take place.

Depending on the goal of business development, it is necessary to approve range signal budget plans, the main task of which is to predict and monitor the continuity of activities. They ensure that financial results are flexible and that management decisions are made in a timely manner to sustain continuous development.

A distinctive feature of range signal budgeting is the presence of maximum and minimum values of key indicators, deviation from which can stop the business process, interrupt the company's activities. Therefore, prompt resolution of emerging problems will allow continuous activity of business entities.

4 Conclusion

Range signal budgeting allows you to predict the intervals of resource bases and the level of profitability of various goods, works, services of consumer cooperation enterprises. The presence of costs above the interval values set in the budgets indicates the need to quickly study them and take measures at negative and unreasonable costs.

Therefore, the use of ranged signal budgets in the budgeting system provides a number of advantages:

- to forecast the continuity of the enterprise and monitor the implementation of business processes;
- to increase awareness, speed and accuracy of work;
- to develop the link between the organization's development strategy and annual planning;

- to conduct continuous examination of the implementation of the planned results and understanding of the reasons for the deviation of the actual value from the planned;
- to improve coordination of actions of structural units;
- to regulate the document flow for budget development and implementation;
- to ensure financial transparency of the enterprise;
- to increase interest and attractiveness for investors.

Regardless of the peculiarities of consumer cooperation enterprises, range signal budgeting will allow controlling the growth rate of income, expenses and profits of enterprises.

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The Role of Humanitarian Education in the Sphere of Cooperation

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Abstract The authors of this article update the role of cooperative education in activating and increasing the sustainability of the development of the cooperative movement in modern Russian society. The article is devoted to substantiating the place and role of disciplines related to the humanitarian cycle in the system of higher professional education, in the training of specialists for the field of cooperation. The team of authors conducted an analysis of scientific research on the history of the development of humanitarian education in general and cooperative as one of the promising areas. Close attention is paid to the formation of the cooperative sector and its importance for the entire economy of the country. The article shows the relationship between the social and economic policies of the state at various stages of historical development and the trends in the development of cooperative education. The authors of the article note that the competent approach underlying the modern education system of the Russian Society suggests that a graduate of an educational institution of higher professional education should master not only professional competencies. The special role of historical knowledge in the formation of personal and professional competencies of future cooperators, in the spiritual and moral education of future specialists is emphasized. It was concluded that only the compliance of the educational system of training personnel for the sphere of cooperation with modern requirements will contribute to the sustainable growth of the cooperative sector of the Russian economy.

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1 Introduction

To date, there is a confrontation between humanitarian and technical education. There are discussions in the scientific community about the value of humanitarian education for specialists in the technical field. This article pays special attention to the system of cooperative education and provides an evidence base for the need to obtain knowledge on both the training profile and the mastery of competencies in the field of humanitarian knowledge.

2 Methodology

Analysis of scientific and historical literature, generalization.

3 Results

The word "humanitarian" is derived from the Latin words humanus—human, homo—human kind. The Great Soviet Encyclopedia gives the following definition to humanitarian education: knowledge in the field of social sciences (history, economics, law, philology, art history, philosophy). This knowledge is intertwined with practical skills. Humanitarian education is an effective means of building a worldview. It serves as an effective tool for the development of people, develops mental abilities (Prokhorov 1972).

Humanities are engaged in the study of human life in society. Their active role is not only to ensure the transfer of scientific knowledge to new generations, but also to form human values.

Plato was the first to lay the foundations of humanitarian education. In conclusion, quality learning is learning that affects emotional, social, and spiritual levels (Konstantinovsky et al. 2006).

Humanities developed as a logical continuation of scholastics. In the Middle Ages, classical university education was a humanitarian, helping to unleash all human abilities. Law, theology, history, medicine, pedagogy and philology arose later. This did not interfere with the fact that classical education had a humanitarian orientation: the Old and New Testaments. The outstanding scientist L. N. Gumilev wrote that

such a science as geography until the sixteenth century. existed as a humanitarian science (Gumilev 1984).

In connection with the formation of the phenomenon of science in the era of the "New Time," its division into natural—scientific and humanitarian disciplines arises. In the nineteenth–twentieth centuries the influence of technology and natural sciences intensified. This process was accompanied by the opposition of scientific and technical knowledge to everything else. And the general opinion to perceive the humanities as secondary and to a certain extent inferior in comparison with natural—scientific—became the realities of that time.

An example of one of them is the discussion that took place in 1837 within the walls of the French parliament when discussing the expansion of the teaching of natural sciences in French schools between the physicist D.-F. Arago and the poet A. Lamartine. The first defended the dominant role of the natural sciences (Encyclopédie pratique de l'éducation en France 1960). A. Lamartin had the exact opposite opinion (Gumilev 1984).

The development in the nineteenth century of history, law, sociology, linguistics, art history, ethics, and the deepening of the study of religion and culture led to the fact that natural science and mathematics were no longer considered as a universal form of scientific knowledge.

This time is characterized by an increase in the specialization of education. Around the world, a network of technical universities grew. Countries such as Germany and the United States can be especially distinguished. Polytechnic and technological institutes gained popularity in Russia, and higher engineering schools in France. General training became specialized; this predetermined the separation of naturally scientific and engineering knowledge from humanitarian education.

Humanism has become the dominant feature of the development of Russian domestic education in the second half of the nineteenth—early twentieth centuries. At this time, the understanding develops that natural sciences are engaged in the study of nature, and humanities—man and societies (Ivin 2004).

The term "cooperative education" has recently entered scientific circulation. Cooperative education is the process and result of learning the beliefs, skills and knowledge of cooperative education. It is one stage in the formation of personality, lays the foundation for the fact that an individual can easily join the system of cooperative movement and cooperation. Education in the field of cooperation helps to guarantee social guarantees in order to establish a sustainable process of self-realization of the individual and education in a cooperative spirit.

The outstanding theorist of Russian cooperation A. V. Chayanov very clearly emphasized the value of cooperative education. The scientist said that both education and education should take place within the walls of cooperative educational institutions, where students become owners of a high culture, a diverse outlook and a stable system of spirituality (Chayanov 1958).

In the twentieth century, the following types of cooperation existed in Russia—consumer, credit, agricultural, production. The creation and opening of specialized educational institutions aimed at training qualified personnel for various types of

cooperatives has become relevant. High value were personnel of medium and higher qualifications.

At the A. L. Shanyavsky University in 1912, a cooperative school was opened in Moscow. The above school existed due to the financial support of cooperators. Students studied courses such as "The History of the Cooperative Movement," "Cooperative Ideology," "Economics" and other subjects related to cooperation.

After the October Revolution of 1917, when Marxism-Leninism became the ideological basis of society, the development of humanitarian education in Russia underwent dramatic changes. Since that time, such disciplines as "History of the CPSU," "Fundamentals of Marxist-Leninist aesthetics," "Marxist-Leninist philosophy," "Scientific atheism," "Political economy" have been included in the country's humanitarian training program.

Personnel for consumer cooperation in the Soviet period were trained by secondary and higher education institutions—a two-level system of professional training. In the 1920s, the Moscow Industrial and Economic Institute named after A. I. Rykova, the Moscow Institute of National Economy named after F. Engels and the Kiev Cooperative Institute were engaged in training personnel for the cooperative sector. Departments for the training of cooperation specialists were opened at the Saratov State University named after N. G. Chernyshevsky, Moscow Institute of National Economy named after G. V. Plekhanov and in a number of others.

At schools, schools, technical schools the preparation and retraining of mass professions was conducted: cook, seller, inspector of the trade, cooperative and procuring enterprises. By the 1920s, their number increased 8 times (Vakhitov 1991) and specialists (commodity scientists, accountants, etc.) for the system of consumer cooperation. Such educational institutions existed in almost all regions and regions of the country.

The lack of qualified specialists caused the need to open a specialized institute of consumer cooperation in the capital. The university was supposed to train specialists in the following main areas of activity:

- economic and planning (economist-planner and economist-statistician);
- production and trade (head of operational departments of cooperative enterprises, economist for the main commodity groups, economist-producer for bakery and public catering);
- educational and cultural (organizer of cultural work, instructor-methodologist, specialist in cinema, book and press).

Universities worked under the motto of the dissemination of cooperative ideas to the masses, the implementation of retraining of personnel for cooperation, scientific developments in the field of cooperative problems were carried out. These trends laid the foundation for the creation of a specialized university for consumer cooperation, initiated by the Central Union.

In 1930, the Moscow Industrial and Economic Institute was reorganized into the Institute of Consumer Cooperation. This organization was directly subordinate to the Central Union of the USSR. In 1930, another cooperative institution opened its doors in Moscow—the Higher Pedagogical Institute of Applied Economics and

Commodity Science. In 1935, which was also logical, these two universities were merged into a single Moscow Institute of Soviet Cooperative Trade (MISCT).

In the 20 years of the twentieth century, the cooperative sector began to depend on the state and fully work under its control, although it was an independent unit once. Since 1929, there has been a complete transition along the wing of the state.

Marxist-Leninist principles become dominant over cooperative education, and the training process specializes in narrowly specialized training of personnel: sellers, accountants, planners, accountants, etc. These specialists came from the walls of technical schools and trade and cooperative schools. In 1950, there were 24 technical schools in the country, 25 trade and cooperative schools—the basis of the country's cooperative education system (Gagieva 2005).

In the period 1950–1980, the formation of cooperative education took place. Emphasis was placed on primary and secondary cooperative education. There were 70 cooperative technical schools, 25 vocational schools and 3 cooperative institutes.

The state and the party carried out an order for personnel, and the cooperative educational network was engaged in training personnel.

The general economic and political crisis that swept the country in the early 90s also affected the state of consumer cooperation. Together with a general decrease in the number of consumer cooperatives, an increase in the number of unprofitable ones, the departure of the most qualified and professional personnel begins (Nevleva 1999). This situation negatively affected cooperative education: the admission and graduation of students was reduced, there was an outflow of teaching staff and the material base of educational institutions was deteriorating. In order to preserve cooperative education in 1992, it was transferred to a compensatory basis. All educational institutions of the system received the right to self-financing train specialists for various sectors of the economy.

This decision of the Central Union and the cooperative public made it possible to preserve and further develop the existing rich material, intellectual, personnel potential of cooperative education. Now the cooperative education system includes 3 universities with branches, 38 technical schools and colleges (a total of 75 educational organizations and branches, in which more than 70 thousand students and students study in 55 specialties of higher and 37 secondary vocational education) (Bernwald 1995).

A new development in the system of cooperative education was the fact of returning to cooperative values—mutual assistance and mutual responsibility, the priority of social and moral foundations over commercial principles.

Higher education has a huge role in the system of vocational cooperative education. Of course, a graduate of an educational institution should be ready for professional activity, master the necessary competencies that will allow him to painlessly and quickly join the professional sphere. The formation of professional competencies, first of all, is facilitated by the study of special disciplines and the passage of practices. At the same time, humanitarian disciplines, including historical ones, also have a significant role in preparing cooperators for professional activity.

The knowledge gained in the course of studying the disciplines of the humanitarian cycle, according to some researchers, is an important factor in personal and professional development.

The first priority in the teaching of humanities is the disclosure of material in order to create an understanding of the modern economic, socio-cultural and political reality among future cooperators.

The basis for studying the disciplines of the humanitarian cycle is the course "History." In the process of mastering Russian history, students-cooperators form an awareness of the social significance of their future profession. Knowledge of the historical past of their country is one of the main factors of the formation of citizenship among young people and a necessary condition for mastering the skill of its application in solving social problems.

A special role in the training of students—cooperators is assigned to historical disciplines, the subject of which is the process of birth and development of the mastered specialty. For example, in the process of mastering the discipline "Theory and History of Consumer Cooperation," students receive knowledge about the main stages of the development of cooperation and the cooperative movement abroad, in our country and in the Republic of Tatarstan, get acquainted with the work of prominent theorists and practitioners of the cooperative movement; master the scientific terminology of the studied discipline, necessary for use in professional activities.

4 Conclusion

To a large extent, subjects in the field of humanities form the professional culture of cooperative specialists. Humanitarian knowledge helps to expand the limits of highly specialized knowledge and skills of future professional cooperators, being the basis for an innovative and mobile specialist.

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Role-Playing Technologies in the Format of Online Education at a University in the Framework of International Vocational-Oriented, Intercultural and Foreign-Language Cooperation

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Abstract Our article is devoted to the problem of training qualified specialists for all sectors of the economy, industry, agriculture and service. The material and practical experience analyzed and studied by us make it possible to say that it is not enough for a university graduate to have knowledge only in his future specialty, but it is important in the modern conditions of the information space to master sufficiently foreign languages and the basics of intercultural communication. Today, the task has become even more urgent. The scientific and practical material we have studied has shown that for the successful process of developing linguistic, intercultural and professional competencies, interactive innovative technologies and techniques have recently become widely used. In our opinion, online tandem training is gaining great popularity. It not only complements traditional classical learning, but also extends its boundaries in many ways. We are convinced that in the framework of online tandem training, case-based role-playing technologies are developed and used in order to make students aware of a specific problem and be able to find the best ways to solve it. The practice of our classes shows that in the modern age of mobile changes, the person is independently able to realize his individual development trajectory in accordance with his abilities, capabilities and needs, and, responsibly, make decisions and effectively realize himself in the modern world. The methodology of mass open online courses developed by us and introduced into the educational process involves the widespread use of role-playing technologies in the framework of inter-subject cooperation.

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JEL Codes I21 · I21

1 Introduction

The relevance of the topic of research is that one of the main directions in the work of modern higher education is the creation of an environment for continuing education.

Information technology is becoming an important tool in knowledge acquisition. Their peculiarity is that the teacher, passing on skills to students, tries to convey the material in such a way that it is in demand and useful in subsequent activities.

The goal of the study is to improve the potential of the individual and develop her professional skills and skills through the use of role-playing technologies in the format of online training within the framework of international and Russian educational standards.

The objectives of the research topic are:

1. Create a platform for synchronous material feed interaction when a teacher and a student jointly create a learning path (Andryukhina 2015)
2. Create a roadmap in the process of learning, erasing the boundaries of time and space. As a result, the teacher and student can conduct classes anywhere and at any time (Kozlova 2019)
3. The use of online role-playing technologies within the framework of international vocational, intercultural and foreign-language cooperation contributes to the quality of knowledge in the field of learning foreign languages and culture of improvement and preparation for future professional activities.

In this regard, intercultural and linguistic knowledge is an important component of the modern educational space. This knowledge allows you to form not only a trained professional, but also a person who has a wide view of man and the world as a whole.

Since the individual is active and constantly developing, we are convinced that professional activities should be aimed at finding solutions to problems using innovative technologies.

As the material analyzed by us shows, at the level of the education system of the Russian Federation, Federal educational laws and standards within the framework of the international educational space, conditions are created for professional reorientation and preparation of a person for future activities (Federal Law 2017).

As you know, the social policy of creating an enabling environment for the development of the use of open educational resources in 2012 at the World Educational Congress on Open Educational Resources was approved by the Paris Declaration on OER. It provided for the creation of favorable conditions for the development and introduction of innovative technologies for the educational environment.

In 2014, UNESCO materials studied by practitioners in the framework of improving the educational space, as well as scientists of international educational law, recognized mass open online courses as relevant and promising until 2028.

As we have seen, a characteristic feature of these technologies was the democratization of the educational process and the elimination of territorial and temporary barriers. Therefore, a modern teacher, creating his own online courses, builds them on the principles of self-education and self-study.

2 Methodology

From the point of view of foreign research scientists, the methodology of mass open online courses is the use of a large amount of educational and information material taken from social networks, which create the foundation for forms and methods of continuous training and contribute to the development and improvement of professional competencies (Titova 2015).

The technology of mass open online courses includes such training methods as training in cooperation, active training, training as part of independent work to consolidate the material studied, project training.

From the point of view of the rector of the Kazan Cooperative Institute of the Russian University of Cooperation, Nabieva Alsu Rustamovna, the cooperation is based on the interests of consumers and producers who must meet the requirements of joint work and teamwork. Therefore, within the framework of cooperative policy and ideology, socio-cultural activities remain an important link (Nabieva and Tkach 2019).

According to foreign authors, the technologies of mass open online courses are able to create an environment for interaction between the teacher and the student in the form of face-to-face and online consultations. This form of work contributes to the fact that the student can, on the one hand, independently study the material provided to him to prepare for the exam, and, on the other hand, the teacher gives advice to the group of students in an online format (Zubkov 2018).

This technology is based on role-playing technology, which creates the prerequisites for teaching according to optimal individual programs, within the framework of which the cognitive characteristics of the student, their cultural and creative interests, motives, inclinations and other personal qualities should be taken into account.

In the course of practical training, we have seen that the technology of mass open online courses should include interactive methods of training to form universal and professional competencies, involving the use of role-playing and game technologies in the educational process (Khutorskoy 2005). This is also evidenced by the Federal State Educational Standard for Higher Education, which we have studied, which pays special attention to the following competencies in the process of mastering the undergraduate program:

NC—4—is able to carry out business communication in oral and written forms in the state language of the Russian Federation and in a foreign language;
NC—5—is able to perceive the intercultural diversity of society in socio-historical, ethical and philosophical contexts;
NC—6—is able to manage its time, build and implement the trajectory of self-development based on the principles of self-education throughout life;
GPD—1—is capable of applying technological innovations and modern software in the professional sphere;
GPD—3—is able to provide the required quality of service delivery processes in the selected field of professional activity (Federal State Educational 2020).

From our point of view, in the modern situation it is relevant to talk about the role of intercultural and linguistic training of future professionals. Therefore, the Federal State Educational Standard for Higher Education states that the interactive interaction of students involves their close cooperation with each other in the performance of various tasks of a linguistic, intercultural and vocational-oriented nature.

At the same time, in our opinion, it is desirable that the tasks presented to students be close to real situations of intercultural interaction, especially in the sphere of the future profession (Bosse 2009).

And, as the material used by us in practical classes shows, the role-playing game in the format of online training becomes more relevant. The value of the role-playing game in the learning process is manifested in thinking and creative abilities, which are very important to the future professional. Role-playing technology creates a situation of intercultural communication, where roles are recognized and changed at the time of their reproduction (Chudaykina et al. 2017). Role-playing games are also effective in learning the real world and improving professional skills. The practical significance of the role-playing game includes a culture of communicative competence. The game method of role-playing technology improves the skills of intercultural and foreign-language cooperation, cooperation and teamwork (Panina and Vavilov 2007).

In the framework of mass open online courses with the use of role-playing games for students, situations are created for the realization of their future professions, while at the same time teaching them intercultural and linguistic interaction (Borshcheva et al. 2017).

In terms of the use and assimilation of educational material, the role-playing game eliminates the gap between training and possible life situations that are associated with professional activities. The student is invited to see the proposed options for resolving situations related to professional activities. At the same time, the teacher should identify individual features of interaction between participants in the game and correct the weaknesses of this interaction in time.

3 Results

From our point of view, we can offer the formation of a role-playing game in the format of online case-based training. As you know, a case is a description of a certain situation or any event most often associated with future professional activity (Litvinova 2015). The situation offered to students contains a problem, options for solving which predict its consequences in the results of the work of the students themselves.

Therefore, cases allow you to dip into the professional environment and analyze real situations with real examples. The main purpose of the cases is to increase the knowledge of students to solve the expected specific practical situation in future professional activities. The result of solving case situations is the development of students' ability to work with information.

Case design technology requires first defining the purpose of case design. In the process of conducting classes, we propose to carry out work on finding sources of case situations: these can be Internet sites, publications in the press, specific cases from work experience, etc. Together with students, it is recommended to select material in order to highlight a problematic situation that stimulates the intellectual search of the students themselves. The collected case technology material is used in practice as a verification material. It shows how interesting the case situation is, informative, whether it causes a discussion between the teacher and the student, and between students, whether it stimulates the corresponding activity in the form of finding options for solving problems.

The practice we studied showed that the case situation as a specific situation is taken with an educational goal from the practice of professional activity and is the basis of other innovative methods and technologies: role-playing business game, discussion, training in cooperation, brainstorming and others. And, conversely, when we use case technology in the educational process, we offer several interactive methods for students at once, for example: group discussion, brainstorming, role-playing.

Case-based role-based technologies are developed to make students aware of a particular problem. In the course of the workshops, students and I are looking for the best ways to solve complex problems. Our observations show that the student skillfully and competently tries to argue and defend his position and interpret the received information. In addition, in working with case situations, students, together with teachers, use elements of general cultural and language training in the process of mastering Internet technologies.

Modern education cooperates with online work. Mass open online courses, as we have seen in the process of conducting practical classes, help students build their own trajectory in learning foreign languages.

The theoretical and practical material we studied in conducting classes showed that the methods and forms of working with mass open online courses can be diverse. For example, we organize an educational process, complementing it with interactive forms of study within the disciplines "Foreign Language" and "International Cultural

Exchange and Business Communications." Also, the material is supplied using audio and video information tools, course lecture texts, tasks for practical application. Our online training test material creates a platform for electronic manuals, guidelines and other educational literature (Rybasova Yu and Mazitova 2018).

Mass open online courses introduce digital technologies into the educational process and organize an environment for classroom and independent work, which contributes to positive results both in learning foreign languages and in improving intercultural and business communications.

In the framework of mass open online courses, we apply the role-playing method, which is interactive. As part of the study of the disciplines "International Cultural Exchange and Business Communications," "Foreign Language" and "Communicative Professional Culture", we use role-playing technologies, where students are invited to develop a scenario of their profession with an emphasis on the study of human relations in intercultural and foreign-language co-operation. In addition, interaction with business partners in interpersonal communication and mutual understanding is recommended. For example, in the form of homework, students are invited to study the legacy of scientists of the Enlightenment and philosophers-scientists of the twentieth century. The drafting of reports and presentations highlighting their business qualities, the spiritual, cultural and professional heritage that they transferred to their descendants is encouraged. We also suggested drawing up a number of issues that would include a discussion about the professional and creative activities of these scientists and how relevant this is within the framework of the modern information environment. Students made presentations on the topics: "Cultural and linguistic heritage in Voltaire's work," "Dialogue of cultures based on modern culture in the heritage of M.M. Bakhtin," "Language as a form of enlightenment of the mind according to Helvetius," "The game function of culture in the work of G. Gadamer, E. Finka, J. Hazing," "Encyclopedic Knowledge of Denis Diderot," "Mechanical Picture of the World in the Era of New Time," "Aesthetics of German philosophers and enlighteners," "Culture of Eurasian peoples in the reasoning of L. N. Gumilev." Reports were presented in Russian, German and English using multimedia innovation technologies and techniques.

By improving our culture and improving the skills of our future profession, we, teachers, try to convey to students the idea that it is important for a modern specialist to analyze and study a different culture within the same profession (Kudryavtseva and Bubekova 2010).

4 Conclusion

In such a way, by using mass open online courses using role-playing technologies and case situations in their classes, teachers get the opportunity to develop the basics of foreign-language and intercultural communication and professional competencies at a higher level and better.

In conducting classes, the teacher identifies the ability of students to manage the situation, evaluate it taking into account the linguistic, cultural and professional components. Also in practical classes, we help students skillfully communicate, focusing on the interlocutor. A properly organized learning process is arranged so that students, using role-playing technologies, position themselves as representatives of the professional community.

The practice of applying the tasks of the role-playing game and its solution by participants in the educational process creates a model of behavior characteristic of everyday and professional life. We are also convinced that the professional content of mass open online courses contributes to the qualitative development of the educational institution in the international educational market.

Acknowledgements As part of our acknowledgment, we would like to note the following:

The modern educational environment contributes to the quality of the supply, acquisition and assimilation of knowledge. A large amount of scientific theoretical and practical material is devoted to this. As teachers, we strive to find the best innovative technologies and training methods.

The interactive methods that we use in the framework of the online format are the preparation of a creative and creative person with his own view of the world and the future profession.

The ability to organize the learning process with the help of modern information and digital technologies is a creative approach that contributes to the intensification of students' development of universal and general professional knowledge, skills and skills, as well as professional attitude to society, to themselves and to their work activities. The communicative culture of the faculty of the university clearly shows, as a rule, not only the level of knowledge of innovative technologies, methods and forms, but also the conditions created at the university for the implementation of these technologies.

The educational environment of the Kazan Cooperative Institute of the Russian University of Cooperation corresponds to the competent approach of educational standards. On the platform of this university, conferences, round tables and events of the regional, Russian and international levels are being held, within the framework of which topical problems are solved, dedicated to improving cooperative development and training of personnel in various fields of activity.

The universal knowledge offered by teachers of our university meets the requirements of both Russian and international quality of preparing students for their future professional activities.

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International Cooperation of Universities in Assessing the Effectiveness of Agrarian Policies

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Abstract Sustainable agricultural development is an important factor in ensuring the national security of any state, and assessing the effectiveness of government regulation is one of the elements of agrarian policy. A research of the problems inherent in the modern stage of government regulation of the agricultural sector, as well as the possibilities of solving them through international cooperation between universities of different countries. In carrying out the research, both general scientific and special methods of scientific knowledge were used: scientific abstraction, dialectics, induction and deduction, analysis and synthesis, detailing and generalization, system, comparative, statistical and factor analysis, economic and mathematical modeling. The analysis of approaches to state support for the agricultural sector in different countries confirmed its objective need and importance for the sustainable development of the economy. A model is proposed with the help of which it is possible to assess the effectiveness of agrarian policy by managing the development of the support subject through the ratio of extensive and/or intensive factors. It was concluded that such an approach could be used to optimize the funds allocated for state support in the framework of regional programs. A conclusion was drawn on the need and possibility of international cooperation of regional universities for joint research to ensure the sustainable development of the territories.

Keywords Agrarian policy · International cooperation · Education · Sustainable development · Agricultural economics

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1 Introduction

The sustainable and stable development of the economy of any country is based on the security of all areas of its life, including agriculture. This is the focus of the already classic report of the International Commission on Environment and Development (http://www.environmentandsociety.org/mml/un-world-commission-environment-and-development-ed-report-world-commission-environment-and/).

The start of the consideration of the role of the state in the accumulation of capital is laid by the works of the classics of economic thought (A. Smith, D. Ricardo, K. Marx and others). The theory of regulation of the market economy is most developed within the framework of the Keynesian school and Neo-Keynesian doctrines. Issues of state regulation of the agricultural sector of the economy are actively being developed by modern economic science. However, a critical analysis of a number of scientific papers showed that many works are purely theoretical in nature or focused on solving private problems of the agricultural sector that do not affect the evaluation of the effectiveness of its regulation by the state.

Interest in the content of Brazilian agrarian policy is predetermined by the country's significant successes in agricultural development and integration into international markets. Over the past 30 years, Brazil has moved from 16 to 5th place in global agricultural production (Cherkasova 2015). This explains Brazil's experience with State support for farmers and approaches to assessing its effectiveness.

A significant part of the functions of the state's agrarian policy is implemented at the regional level. The special role and purpose of regional universities is to carry out applied research aimed at solving regional problems. This circumstance led to the choice of the topic of research.

2 Materials and Methods

The object of the research is the system of state regulation of the agricultural sector. The subject of the study is economic relations arising in the process of implementing an agrarian policy aimed at ensuring the sustainable development of the state. The theoretical and methodological basis of the study is the legislation of different countries, scientific works of foreign and Russian scientists, reference and methodological materials, documents of regional authorities and management bodies in the field of sustainable agricultural development.

The information base of the study is data from the Ministry of Agriculture, Livestock and Supply of Brazil, *Instituto Brasileiro de Geografia e Estatística (IBGE), Instituto de Economia Agricola (IEA)*, economic data for states and municipalities, author's calculations. Data from Rosstat, the Ministry of Agriculture of the Russian Federation, targeted regional programs for the development of agriculture, the results of economic research on the implementation of agrarian policy were used.

This article is based on numerous published works on the problem posed, in particular, on the work of Zhangorazova and Ustova (2011).

3 Results

The idea of writing this article arose due to the similarity of the scientific and practical interests of scientists at regional universities in Brazil and Russia aimed at studying the agricultural sector of the economy. The choice of regions and industries for study is explained by the fact that sugar production is one of the most important sectors of the economy and an export item from different countries of the world. Brazil ranks first in the world in the cultivation of sugarcane. Russia is the largest producer of sugar beets and exporter of sugar, so the results of research by Brazilian scientists are of scientific interest and can be tested in Russian conditions.

Retrospective analysis of sugarcane data showed a significant correlation between the role of the state and progress in the spread of the culture. The theoretical assumptions of the authors of the article are based on world studies regarding the role of the state in the creation and regulation of agro-industrial scientific and production chains (Davis and Goldberg 1957; Goldberg et al. 1996; Karantininis and Zibersztajn 2007; North 1992). In such a way, Davis, John H. and Goldberg, Ray A., considering an extensive topic, emphasize the role of government regulation of the agricultural sector and economic support for research in this area (Davis and Goldberg 1957). The importance of combining formal and informal institutions in a market economy is confirmed by the analysis of transaction costs (North 1992). A fundamental approach to understanding the processes of agricultural production in the macro environment is noted by Karantininis and Zibersztajn (2007).

In the 1970s, Brazil saw a significant increase in the sugar cane industry, accompanied by the development, introduction and rapid replacement of varieties, as well as the expansion of crops through the involvement of pastures that are unsuitable for land use and the reduction of crops of other crops (Belik 1985; Francisco et al. 2010). Significant progress has been made in the private–public partnership in the field of breeding varieties, including in the state programs sugar plants with areas for testing new varieties and testing innovative agricultural techniques (Belik 1985).

A retrospective analysis of the dynamics of sugar cane production in the state of São Paulo for 1950–2010. made it possible to assess the effectiveness of state support taking into account the main factors: sown area and yield (Pissinato 2014; Pissinato et al. 2019). The evolution of the production and technological structure of agriculture in Brazil is detailed in a contemporary publication (Vera Filho and Tollini 1979).

In order to assess the effectiveness of agricultural policy, a modified version of the model Vera Filho, F. and Tollini, H. (Vasilenko et al. 2017) was used:

$$CA = (A_t - A_0)R_0(P_t - P_0)^{-1}100$$

$$CR = 100 - CA$$

where:

A_t—sown area in the last year of the period;
A_0—sown area in the first (base) year of the period;
R_0—average yield in the first (base) year;
P_t—production of the last year of the period;
P_0—production of the first (base) year of the period.

Using the factor analysis technique, the degree of influence on the result is calculated: (a) a quantitative (extensive) factor, which shows an increase in the effective indicator due to the expansion of the sown areas ("contribution of area, in%—CA"), (b) a qualitative (intensive) factor, which shows an increase in the effective indicator due to growth in yield ("contribution of yield, in %—CR").

An analysis of empirical data conducted by Brazilian scientists using this model over a long period (more than 60 years) identified periods in which the increase in sugar cane production was ensured by a quantitative factor (expansion of sown areas) or by a qualitative factor (increase in yield). Until the 1950s, the primary influence of the first factor was observed, later the system began to dominate the yield factor, demonstrating the role of progress in breeding and agricultural technology, including through the implementation of state programs to support the industry. Based on the analysis, the authors reached the following conclusions. Firstly, the policy of implementing state programs contributed to the sustainable development of a number of territories: the best results were achieved here. Secondly, until 1990, the state actively regulated the industry for the production of this culture. After 1990, the state began to leave this sector, creating functioning structures in the form of conglomerates that realize the interests of the state, research and educational institutions, as well as private enterprises.

The necessity and significance of such integration are emphasized by Russian scientists (Kundius et al. 2017). The authors of this article analyzed the targeted regional agricultural development programs of 25 Russian regions. Their implementation within the framework of the program-targeted approach used in the state regulation system of the Russian Federation involves an assessment according to two main criteria: (1) the ratio of the actual and planned values by program indicators; (2) ratio of actual and planned financial resources.

An analysis of the scientific publications of Russian authors shows that this issue is debatable. A number of researchers consider the assessment of the effectiveness of state regulation of the agricultural sector one of the main problems, pointing out the formal nature of the criteria and noting that the monitoring of programs is aimed only at monitoring their implementation and does not provide for an assessment of its effectiveness (Kolesnikov 2019; Nesterova et al. 2020; Vian et al. 2018; http://www.environmentandsociety.org/mml/un-world-commission-environment-and-development-ed-report-world-commission-environment-and/).

In the light of the above, it is of practical interest to organize international cooperation among regional universities in addressing the problems of the agricultural

sector, including those noted above. The academic revolution that universities around the world are exposed to (Altbach et al. 2018; Mihut et al. 2017) makes the need of universities for cooperation objectively necessary. Regional universities have an important role to play in the development of the scientific issues of sustainable development of the Territories (Bobrovskaya et al. 2019; Mezhov and Tarasova 2019). Their inclusion in the system of international cooperation, for example, on the basis of the BRICS University network, will be the key to dynamic development, a way to increase competitiveness in the world market of educational services (Neretina 2013; Oganesyan 2017; Smotrova 2019).

4 Discussion

The results of the empirical research confirm that government regulation of agriculture is objectively necessary and a way to ensure sustainable development. The analysis of scientific literature and documents makes it possible to identify a number of problems:

a. inadequate methodological approaches to assessing the implementation of targeted regional programs in terms of their effectiveness;
b. the focus of program monitoring is on monitoring the implementation of program activities rather than assessing their effectiveness;
c. underestimating the study of foreign experience related to the analysis of the effectiveness of government regulation of the agricultural sector;
d. insufficient participation of regional universities in international cooperation to solve problems of regional development.

The practical significance of the research is that the results and recommendations obtained can be taken into account by regional universities when developing strategic directions for development, topics of scientific research, preparation of grants and projects, etc.

5 Conclusion

Further research should be carried out in the following areas:

- development of an integrated system for assessing the effectiveness of government regulation of the agricultural sector of the economy;
- development and testing of a model for assessing the effectiveness of the State funds allocated to support agricultural sector enterprises in various sectors of agricultural production;

- development of recommendations to regional authorities and administrations on the development of forecast scenarios and options for assessing the effectiveness of budget funds allocated for state support;
- development of a normative and methodological framework for the organization of international cooperation among regional universities.

The expansion of scientific and practical research by regional universities, based on international partnerships, will accelerate the transfer of scientific results to the practical activities of agricultural enterprises, as well as increase the competitiveness and academic reputation of universities at the global and national levels.

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Design of Networking Between the University and the School as a Type of Cooperation of the Future

Andrey A. Selyutin, Elizaveta V. Limarova, Larisa I. Tararina, and Ekaterina I. Sokolova

Abstract Vision of the future finds reflection in many large foresight researches of various level and orientation, hypotheses and forecasts of certain analysts, leading experts and practicians, social movements and forums (Global Education Futures (GEF), UNESCO, New Media Consortium (NMC), Oxford Martin College, Skolkovo, SOD Russia 2045, etc.). The model of knowledge economics suggests that education becomes a key area of the life of society (Raven in Competence in modern society. Moscow, 232 p, 2002). It is education that forms the scientific and technological base of the economy and human capital. The economics of knowledge in the context of universities is the generation of new and unique knowledge, its accumulation and transformation through the implementation of applied and basic research in order to accelerate its own growth and increase competitiveness. Especially interesting from this point of view is the design of the network interaction between the university and the school, as an inextricable continuous chain of knowledge transfer and the formation of a future successful professional—consideration of the aspect of interaction between these two institutions is the goal of our work. As basic methodological tools, we have chosen design, oriented to building a model of interaction and predicting the nuances of joint activities of school and university. In this article, we tried to take into account various factors that contribute to or impede this collaboration.

Keywords Cooperation · Networking · Design · University · Knowledge economy

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1 Introduction

The dynamics of changes in the economy, science, production leads to a rapid obsolescence of knowledge, depreciation of individual skills, therefore, along with the formed competence for employers, it becomes very important to assess the potential of the employee to learn new knowledge and form new skills (Klimenko 2010). From this statement we can infer the idea that for a graduate of an educational institution it will be extremely important to have universal competencies on which he can rely in the performance of specific professional duties, work in a specific professional team. As a basic definition of professional competencies, we can use the following: this is the ability to purposefully create, expand and modernize our knowledge and skills in response to changes in environmental conditions (Zeer and Zavodchikov 2007).

The need to develop universal competencies that can help a professional to navigate economic and technological conditions and remain in demand may be due to several reasons:

(1) increasing the competitiveness of graduates in the labor market in conditions of fierce competition of educational institutions with similar areas of training and places of practice. Therefore, the formation of dynamic competencies that meet the needs of potential employers and the labor market will give a certain competitive advantage;
(2) compensation of temporary expenses for obtaining a diploma of vocational education (obsolescence of professional knowledge during university studies) by an effective mechanism of adaptation to a changing workplace;
(3) the use of modern educational technologies, the development of interdisciplinary ties, the effect of self-training and communication, the availability of various educational programs, etc.—all these, and not only, factors turn the need into the inevitability of the formation of dynamic competencies (Fedorov et al. 2012).

Therefore, research aimed at establishing the dependence of a graduate's professional implementation (his adaptation socially and professionally) of a higher educational institution on the successful development of universal competencies in the learning process is of particular importance (Medvedev and Skripnichenko 2011). In this regard, the network interaction between the university and the school can build a certain educational trajectory that allows organizing an earlier profiling and specialization of the student.

In the federal state educational standard of secondary general education of Russian Federation there is a component designated as "educational research and project activities of students as a means of improving their universal educational activities." It is understood that in the course of this training, all senior school students

should have competencies that will allow them to independently formulate a pre-design idea, set goals, describe the necessary resources, use elements of mathematical modeling and analysis as a tool for interpreting the results of research, etc. At the same time, in 2020, Chelyabinsk State University adopted the Strategy for the Development of Educational Activities of Federal State Budgetary Educational Institution of Higher Education, Chelyabinsk State University for 2021–2024, which indicates the Activity 1.2. "Creation of a design-oriented platform for schoolchildren and applicants (including on the basis of the Malaya Academy and University classes of Chelyabinsk State University)," providing for the creation of a project activity center for general education organizations within the framework of the state educational standard of secondary general education.

2 Methodology

The concept of universal competencies is closely related to the concept of "adaptation," which literally can be understood as adaptive competencies that allow you to successfully integrate into the workspace, regardless of conditions (Teece et al. 1997). Such universal competencies include: (1) language/communicative literacy/communicative skill. The development of this competence will positively affect the general development of thinking and the ability to adequately respond to any emergency situation; (2) the ability to generate new knowledge (since knowledge has the property of becoming obsolete very quickly and therefore the employee is forced to either constantly improve skills or learn to generate knowledge on his own)—in principle, this can significantly save the time and finances of the organization, on the other hand, will give competitive advantages in the form of new information (Morozova et al. 2016); (3) knowledge of teaching methods. In many groups, instinctive communication occurs when beginners are attached to craftsmen who introduce them to the peculiarities of working in a particular place (share experience). This technique is used in factories, industrial enterprises in construction, when there is no time for theoretical training, it is much easier to attach a young employee to an experienced one who will transfer this knowledge in an accessible and understandable form (Shestak et al. 2013). And if you develop this ability consciously (the ability to teach others to teach), then the process of managing the knowledge economy can be more conscious and predictable.

Questions to be answered are:

1. What do we need these universal competencies for (what task can be solved with their help)?
2. What competencies do the employer need? (method of solving the question: questionnaire of the employer, interviewing);
3. Will this increase the demand of such specialists (with dynamic competencies) in the labor market? (method of solving the question: survey of potential employers);

4. Will the introduction of such competencies into the educational process be economically beneficial to the university/faculty? (method of solving the issue: miscalculation of costs, for example, training of teachers, educational materials, technical equipment of audiences/departments, involvement of third-party specialists; miscalculation of profits, for example, an increase in the number of applicants attracted by the successful work of the educational program, an increase in the percentage of applicants who have reached the end of their studies, etc.);
5. How serious will the changes in the educational process be given the focus on these competencies? (The solution is to determine whether these competencies should be developed in all training sessions, or whether it is sufficient to include several modules in individual courses);
6. How can these universal competencies be shaped? (method of solving the issue: study of domestic and Western technologies, methods).
7. How can we test the digestibility of these competencies in students? (method of solving the issue: developing a tool for verifying the results of the implementation of universal competencies, interviewing employers, feedback from colleagues from the workplace, feedback from teachers on academic performance, objective improvement in the quality of work performed).

3 Results

We believe that the conditions that are now being formed in the system of higher and secondary general education are extremely favorable for the creation of network interaction between school and university in the format of project activities, and as an idea we want to propose a joint project presented by the following elements:

Participants: (1) students of the 7th–11th grade of the partner gymnasium, (2) students of the Department of Pedagogical Education of the Faculty of History and Philology of Chelyabinsk State University, (3) undergraduates of Chelyabinsk State University trained in research/project activities and acting as tutors, (4) teacher of the Department of Theoretical and Applied Linguistics - head of practice, who exercises general guidance from the university, (5) teacher (s) (la gymnasium).

Timing: It is determined taking into account the interests of the school and university. At the university, students of 2 and 3 courses of pedagogical education undergo distributed practice from February 01 to June 30, and the protection of coursework is staged from May 10 to 20. At school, students usually carry out projects in the spring and protection takes place in late April—early May. It is possible for us to indicate the dates of the project from February 01 to May 30, taking into account the preparation and submission of reports, including project managers, after project protection.

Venue: It is determined by the project participants, it is assumed that students will work in a team with students using remote means (zoom, skype, social networks,

etc.). If necessary, schoolchildren and students can periodically (for example, once a month) meet in person at the school or Chelyabinsk State University to discuss work on the project. Students defend their project on the basis of the gymnasium, students protect the product of the project and report on the past practice on the basis of Chelyabinsk State University in the format provided for by the working program of practice (stages of the project, work on them, results of project protection by the student, results of joint and individual work during the project, etc.).

Content: At the end of January, an installation conference of organizers takes place, at which the composition of teams, project topics are determined, deadlines and other organizational points are specified. In early February, a meeting of participants is held, they are divided into groups (1 + 1 or 2 + 2). Each group selects a theme. As an option, the topic can be selected for the student's course project (the design part of the course work) in order to increase motivation. After selecting a topic, the groups draw up a work plan for the project, for each part of which they will report according to deadlines (every 2 weeks). Depending on the number of groups, tutors are defined. A table of participants is compiled, contacts and communication tools of working groups are prescribed. Each group works offline, 2 times a month a control section of the work performed by the practice manager is made.

Design development of scientific research:

(a) pre-design idea of the research;
(b) formulation of a scientific hypothesis;
(c) setting the purpose and objectives of the study;
(d) selection of data collection and analysis method (s);
(e) planning of works required for successful completion of the project (Gantt chart construction);
and (e) the assessment of resources, including intangible resources (such as time), necessary to achieve the objective.

Scientific research:

(f) material collection and primary treatment/experiment
(g) analysis and interpretation of the obtained data (including using mathematical methods)
and) verification of the received data
(h) project/study risk assessment and ways to minimize these risks (SWOT analysis)
(i) assessment of the consequences of the implementation of its project (changes that it will entail in the life of other people, communities), if possible;
(j) assessment of further development of the project or study, possible options of application of results.

We believe that if this idea is implemented, it will result in a very interesting experiment—a project in the project, the successful completion of which will largely depend on competent management, responsible project management (Furyaeva 2016). That

is, in addition to the general idea, it is necessary to see the area of responsibility and present the managerial steps necessary for the successful implementation of the project. Therefore, according to domestic and foreign researchers, the following can be attributed to the main management processes:

1. overall change management—identify, agree, approve and accept corrective actions and coordinate changes throughout the project;
2. resource management—making changes in the composition and assigning resources to the work of the project;
3. goal management—adjustment of project objectives based on the results of analysis processes;
4. quality management—development of measures to eliminate the causes of unsatisfactory execution (Key concepts and processes of project management 2017).

4 Conclusion

As an element that enhances the usefulness of the introduction of universal competencies, one can consider the possibility of building mixed groups (domestic and foreign students) when designing educational programs. This will allow, firstly, to attract an additional contingent of domestic students who will be interested in receiving active language practice, on the other hand, will increase interest among foreign students (for the same reasons). A number of tasks can be identified to increase the success of attracting foreign students: (1) attracting foreign students, with the orientation of their work in our country, in our organizations. The introduction of universal competencies will contribute to a more successful adaptation of foreign graduates to the realities of the Russian labor market. (2) The option of mixed groups is possible—Russian students and foreigners study in groups (interaction effect, competitive element, language practice). (3) search for foreign students for the workplace (i.e. we find an employer who needs a foreign employee, look for a foreign student, teach, pass on to the employer).

According to Podolsky and Pogozhina (2016), the design boundary passes where the implementation begins. Therefore, in our project idea, we do not lay down the stage of testing the resulting project idea, especially if the idea is not design, but research. The result of the project/research work for schoolchildren we propose to consider the product presented either in the form of a completed study, or in the format of a materialized idea ready for implementation; for students, the product will be a chapter in coursework/practice report.

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Application of Formal Models in the Applied Software of the Simulator "Driving School-Driving"

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Abstract Digitalization and wide introduction of advanced information technologies, based on the applied application of mathematical methods and models, affect all areas of life of the Russian Federation. The development and implementation of software (software) in the road transport area, when preparing the driver's train, is an urgent task. The article deals with the application of some of the models presented in the works (Georgiev et al. in Stud Syst Dec Control 316:89–97, 2021; Epifanov and Epifanova in Maintenance and repair of cars, 280 p, 2017; Zotov in Investigation and prevention of road accidents, 245 p, 2016) in the simulator systems of driving schools for training and training the drivers. The applied use of algorithms of mathematical models is considered, such as: graph (automatic) model, tensor model and some other models. The implementation of this approach is presented in the form of applied software of the Auto School-Driving training complex. The "Driving School" simulator is designed for motorists and includes: original application software; a hardware and software unit including a computer peripheral device and an analog-to-digital converter; ergonomic workplace of a motorist. The software allows you to teach confident taxiing skills, competent speed switching and braking skills, complex actions in non-standard situations on roads, on highways, in the city, etc., The Driving School-Driving training complex software allows you to prepare in conditions of different grip of car tires with pavement; preparation for driving in winter conditions; modeling and the possibility of combining different weather conditions. All these different modes, the application software allows you to combine when modeling the road situation in virtual space. The original software allows you to typologize cars according to different criteria: by brands; by gearbox type; by drive type; by engine type, etc. In the Applied Software, the possibility of training in of training of motorists to avoid road incidents deserves special attention.

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Keywords Information technology · Application software · Mathematical models · Mathematical methods · Simulator system · Automotive driving · Training · Graph model · Tensor model

JEL Codes L86 · M15 · C80 · D58

1 Introduction

Digitalization and wide introduction of advanced information technologies, based on the applied application of mathematical methods and models, affect all areas of life of the Russian Federation. The development and implementation of software (software) in the road transport area, when preparing the driver's train, is an urgent task. The work considers the application of some of the models presented in works (Georgiev et al. 2021; Epifanov and Epifanova 2017) in the simulator systems of driving schools for training and training of the driver's train. The applied use of algorithms of mathematical models is considered, such as—a graph (automatic) model, a tensor model and some other models. The implementation of this approach is presented in the form of applied software of the Driving School-Driving training complex.

2 Materials and Method

Innovative processes in the field of transport are today an urgent reality. Innovation has affected the whole system. The person who becomes the main participant and according to the role performed on the road, bears an important part of the responsibility. The road, which is equipped in accordance with the new achievements of scientific and technological progress. And the driver, as the most active participant in road and road situations, must meet all new challenges on the road. Relevant is the training of reliable, psychologically stable drivers with effective driving experience. Practice shows that this can be achieved by using scientifically sound and practical-oriented methods of training drivers (Tick 2016; Kondrakov 2017; Kuzmin and Stepkin 2020; Fakhertdinova and Bogomolova 2020). Qualitative results are given by driver training methods, which are used in the training process by advanced simulator computer systems, in which, in the form of application software, situational algorithms of the driver's actions in real life situations that he may encounter (and will collide with) in driving on highways are implemented.

The digitalization of the motor transport industry aims to develop and implement software and hardware training systems for training drivers.

In order to achieve the stated goal, we will solve two groups of problems. The first is to investigate the basics and develop a scheme for the educational route of the vehicle; Consider practical exercises on the route; Analyze the need for situational

driver training; Analyze the process of training in driving courses in the organization; Investigate the technology of driving training on a vehicle; develop events to improve the organization and technology for the provision of driving training services in the organization; Calculate the effectiveness of the proposed events.

The main priority areas and methods of the second group of tasks to improve the theory and practice of driving will be: firstly, training drivers on simple simulators in order to achieve basic regulatory skills of the driver's response to the road situation; secondly, training drivers on complex simulators (using electronics, personal computers, steering wheel simulators and other components of the car) in order to achieve professional driver response indicators on the road; thirdly, training drivers of different levels of training in competent response actions in non-standard road situations, etc.

The solution of the tasks is presented in the form of applied software of the gym complex "Driving School." For the layout implementation, the following were chosen: a graph model based on game theory, and a network (specifically—tensor) model. The graph model is the classic and simplest example of a model suitable for constructing a training layout. A model based on a tensor representation is well developed in the form of theory, but is not often found in practical use, so the construction of an educational layout based on it can serve as a training basis showing options for its application in practice.

3 Results

The training complex "Driving School" is designed for motorists and includes:

(1) original application software based on the application of such formal models as: graph (automatic) model, tensor model;
(2) a hardware and software unit including a computer peripheral device and an analog-to-digital converter;
(3) ergonomic workplace of the motorist, including simulators of the steering wheel of the car, brake pedals, gas, clutch; side mirrors, rotary signal switch unit, parking brake and speed switch unit, etc. All imitators create a sense of reality, as they use 3D component. The sensors read the movements of the motorist and the forces applied to the components of the units and, converting into electrical signals, transmit these signals to the hardware and software unit.

The software allows you to teach confident steering skills, competent speed switching and braking skills, complex actions in non-standard situations on roads, on highways, in the city, etc.

The software of the training complex "Driving School" allows you to carry out the following types of training:

(1) preparation for response in non-standard situations on the road: training of competent overtaking skills on the highway during oncoming traffic, driving

on roads with long steep descent and long steep rise, training and training in stable skills of a competent and safe start of traffic ("touching") at a traffic light in conditions of steep road rise, etc.;

(2) preparation in conditions of different adhesion of car tires with road surface: dry asphalt, wet asphalt, ice, gravel, sand, clay, etc.;

(3) Preparation for driving in conditions of the winter route: overtaking a sudden obstacle, overtaking in conditions of snow drift, overtaking in conditions of heavy rain, etc.

Modeling and the possibility of combining different weather conditions: torrential rain with a "wall," bright sun in the eyes, strong hurricane wind, shallow rain and icing, etc.

All these different modes allow you to combine when modeling the road situation in virtual space.

The original software allows you to typologize cars according to the following criteria:

(1) by brands: there is a choice of a car brand out of 12 possible;
(2) by gearbox type: automatic, mechanical, variator;
(3) by drive gear type: full, front, rear;
(4) by engine type: gasoline, diesel, electric.

In the Application Software, the possibility of training of motorists to avoid road incidents deserves special attention:

(1) includes the possibility of developing the skills of sharp braking of the car (after a sharp acceleration) to a complete stop (brake pedal to the floor), practical development of this skill allows the motorist to feel the driven car and prevent a sufficient number of accidents in real life;

(2) provides the opportunity to develop stable skills of mandatory control of the "blind zone" of the car before the car is rebuilt into a neighboring row.

The algorithmic solution of the problems of the first group of the second section is presented in the form of an approach to the representation of behavior in the form of a hierarchy of processes of a special type—finite processes. Each finite process and its relationship in the hierarchy are described in natural language. The solution of the second group of tasks is based on the concept of the process. A model is built that takes into account the user's actions and describes the policy and response processes (Ponomarenko and Rubanov 2010; Smolentseva 2017; Fakhertdinova and Chernova 2020; Fakhertdinova et al. 2020).

The need to study the effectiveness of using other formal models to solve the groups of problems presented in the second section of the article may be suggested as a subject for discussion. Such models include: models based on semantic networks; models based on the theory of formal languages; relational data models; game theory models; Petri functional network models; probabilistic models.

4 Conclusion

The article considers the approach of applied application of two models presented in works (Georgiev et al. 2021; Epifanov and Epifanova 2017) in the simulator systems of driving schools for training and training of the driver's train. Applied use of algorithms of mathematical models, such as—graph (automatic) model, tensor model, is considered. The implementation of this approach is presented in the form of applied software of the Driving School-Driving training complex.

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Institutional Changes in the Peculiarities of the System of Motivation and Socio-psychological Climate of Interpersonal Relations of the Consumer Cooperation System

Elena G. Kirikutsa, Alla V. Khromenko, Galina N. Dudukalova, Vladimir V. Dudukalov, and Olga L. Grigorieva

Abstract The article is devoted to the research of institutional changes in the system of professional motivation and socio-psychological climate in consumer cooperation organizations. Determination and evaluation of professional motivation are the main priority tasks of professional selection, professional, psychological and economic components of the personnel management process in consumer cooperation organizations. During the experiment, the peculiarities of professional motivation should be analyzed with special empirical diagnostic methods in order to improve the personnel management system and form interpersonal relationships in the team. At the same time, it should be noted that there is no unambiguous connection between professional motivation and human activity, since there are many accidents and subjective circumstances, such as mood at the moment, understanding of the situation and the influence of third parties. Motivation is based on the given long-term noted impact on the employee with the general goal of theory of structure change of his sphere of value satisfaction of orientations and development of state of interests in successful accordance with the given parameters, developed formation of corresponding basic motivational middle core and development on the matter of this awareness on the basis of his labor supporting potential. The essence of effective motivation lies in the

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creation of criteria designed to comprehensively regulate labor relations, presented in the form of basic theories of motivation. The originality lies in the institutional approach to the study of interpersonal relations in the system of consumer cooperation by conducting an experiment to identify the impact on staff of socio-psychological methods.

Keywords Motivation system · Socio-psychological climate · Professional motivation · Human resources management · Institutional changes · Consumer cooperation

JEL Codes Q01 · Q13 · D7 · M54

1 Introduction

The relevance of the research is due to the fact that the professional activities of participants in the consumer cooperation system are carried out in conditions of uncertainty associated with the influence of a significant number of stressful, risky factors.

Uncertainty establishes new conditions for professional motivation, as well as for the psychological qualities of the person. The issues of institutional development of staff professional motivation through socio-psychological methods are a rather topical and little-studied problem. Social and psychological methods of motivation are the cornerstone of the effectiveness of closed groups, such as cooperation. Based on this, the most important and possible methods of motivation of staff are socio-psychological. These methods require constant updating, making new proposals to the organization, developing adequate motivation methods that make it possible to significantly increase its effectiveness, which is extremely important in the economic and geopolitical situation in the country and the world. Evaluation criteria and institutional development of professional motivation are one of the priority tasks of competent, professional selection, professional, psychological and operational-technical training of professional personnel for cooperation organizations in various regions of the country.

The purpose of the research is to study the peculiarities of institutional development of professional motivation, social and psychological climate, interpersonal relations of the system of consumer cooperation of the Saratov regional consumer union.

In order to qualitatively determine the institutional development of professional motivation and the socio-psychological climate in the system of consumer cooperation, we will form a number of tasks:

- to conduct an experiment to identify the degree of satisfaction with the motivation system in a certain link of consumer cooperation (Saratov Regional Consumer Union);

- to develop a methodology for conducting an experiment to identify institutional changes in satisfaction with motivation and the socio-psychological climate in the system of consumer cooperation;
- to interpret the obtained data during the experiment.

2 Materials and Methods

The fundamental foundations of the scientific issues studied in this article are laid in publications of Ginis et al. (2016), Yakobson (2019) and Zakharova and Gavrilova (2008).

In accordance with the design of the experiment, we need to carry out the following procedures:

Stage 1. Selection of diagnostic research techniques and selection of the experimental group.
Stage 2. To carry out, according to selected methods, diagnostics of professional motivation and socio-psychological climate in interpersonal relations:

1. Testing of interpersonal relationships according to the method of Schutz (1958). According to the chosen methodology developed by the American Psychologist V. Schutz, based on the postulates of the three-dimensional theory of interpersonal relations, the Russian version of which is the FIRO (Fundamental Interpersonal Relations Orientation) questionnaire known abroad (Schutz 1958), it should be argued that the fundamental factor in the theory is the provision that any person has a certain way of social orientation in relations.
   Using this technique, it is possible to evaluate personality behavior in the area of interpersonal needs: "inclusion" (I), "control" (C) and "affect" (A).
2. The method of K. Zamfir is to study the motivation of professional activity (Zamfir 1983).
3. Group Cohesion Index Analysis by C. Sishor Method (Potemkina 2016). For cooperative organizations, this method is significant, since it shows the level of cohesion and integration of the team in order to achieve certain goals. In this methodology, there are only five questions with different levels of answers.
4. The technique of Bordovskaya N. V., Rean A. A., (Peters 2018) will make it possible to assess the socio-psychological climate in the team. Using this technique, it will be possible to determine the psychological climate in the team.
5. A survey of employees of cooperative organizations on a specially developed questionnaire on the study of the use of socio-psychological methods of motivation of participants in the experiment in the system of consumer cooperation of the Saratov regional consumer union.

Stage 3. Interpretation of experimental data and recommendations.

56 respondents participate as a sample for an experiment to identify socio-psychological methods of institutional improvement of the motivation system in consumer cooperation.

Next, we will determine the main results of the research and present their analysis.

3 Results

At the initial stage of the study, we will diagnose interpersonal relationships according to the method of Schutz (1958). Figure 1 presented results on the method of studying interpersonal relations of V. Schutz.

In such a way, from the data obtained, it can be seen that in the whole group there is a pronounced behavior in the field of control—6, affect—6, the required behavior in the area of inclusion—6 is well expressed.

In general, this sample has an urgent need to use force and control in human relations to position itself as a competent person. Based on the results, these relations can be characterized from different positions: exercise power, control, or vice versa, avoid the area of responsibility.

It should also be noted that the same person does not combine zones of power and responsibility. The results show that the severity in the control area—5, in the effect area—5, in the inclusion area—5, this suggests that there is a need to be in contact with all members of the group.

Further, according to the method Zamfir (1983) studied the motivation of professional activity.

The percentage of motivation of the professional activities of the participants in the experiment, employees of the Saratov regional consumer union, according to the method of K. Zamfir is shown in Fig. 2.

Therefore, 47% has an average level of professional motivation, which is characterized by the fact that participants in the experiment associated with physical activity have an average of the main types of motivation. 53% have a reduced level

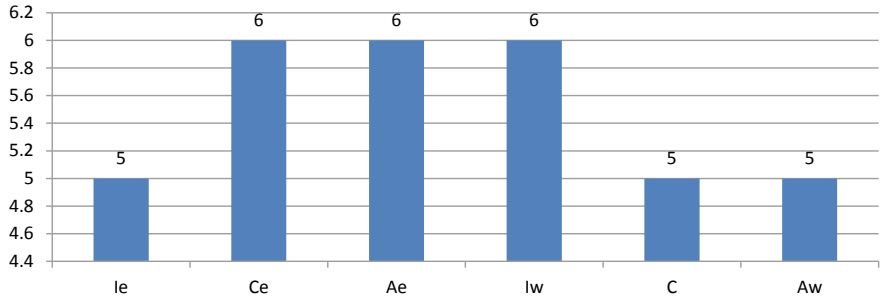

Fig. 1 Specifics of interpersonal relations according to the method of V. Shutts. *Source* Developed by the Author

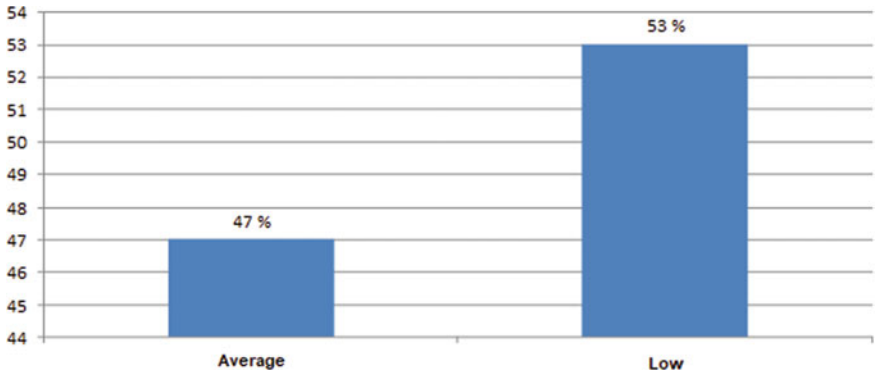

Fig. 2 Percentage ratio of motivation of professional activity according to the method of K. Zamfir. *Source* Developed by the Author

of professional motivation, which is characterized by the fact that all three types of motivation are poorly expressed.

Next, we present the results according to the method of Potemkina (2016).

Percentage ratio of indicators according to the selected method is shown in Fig. 3.

Therefore, it can be concluded that 47% has an average level of group cohesion, this level is characterized by the fact that 28% has an index below the average, 25% has a low, which indicates that in general there is disunity in consumer societies.

The next stage of the experiment was the study of the socio-psychological climate in the team in interpersonal relations.

In Fig. 4, we can see the results of the socio-psychological climate study in the experimental group clearly.

Therefore, it can be concluded that 38% noted the socio-psychological climate as positive and quite favorable, 62% of the subjects had conflicting results. No negative

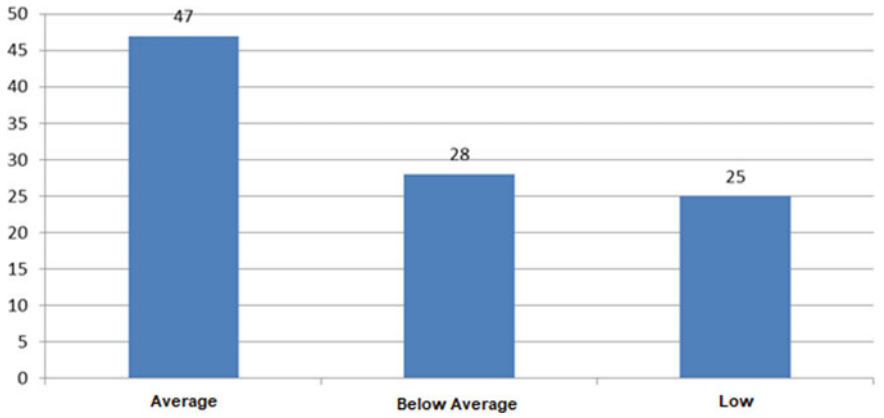

Fig. 3 Diagnostics of group cohesion index. *Source* Developed by the Author

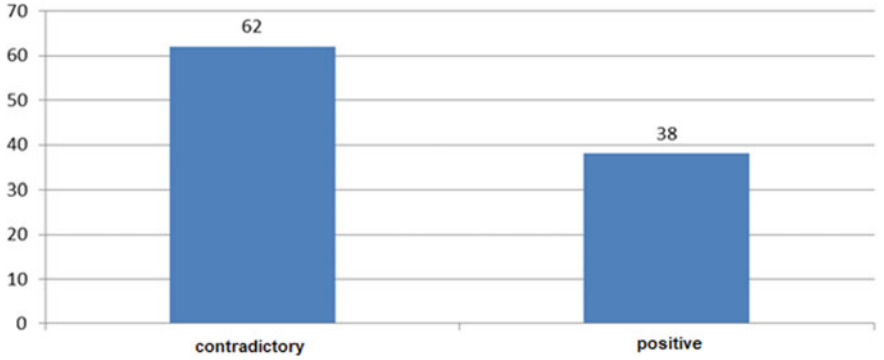

Fig. 4 Results of social and psychological climate diagnostics. *Source* Developed by the Author

indicators were found. Consequently, we can conclude that most employees of the Regional Consumer Union are not satisfied with relations in the team, dissatisfaction with motivation methods is noted, the socio-psychological climate does not suit them, which caused the need to conduct a survey of employees.

In order to identify problems in the field of professional motivation among employees of the organization of cooperation, a survey was conducted.

The analysis of the received answers to the question "Are you satisfied with the motivation system in consumer cooperation?" is shown in Fig. 5.

Therefore, it was revealed that 55% of respondents are satisfied with the professional motivation system and noted that this motivation system is not completely thought out, and 45% believe that nothing needs to be changed.

The results to the question "Are you satisfied with the methods of socio-psychological motivation?" are shown in Fig. 6.

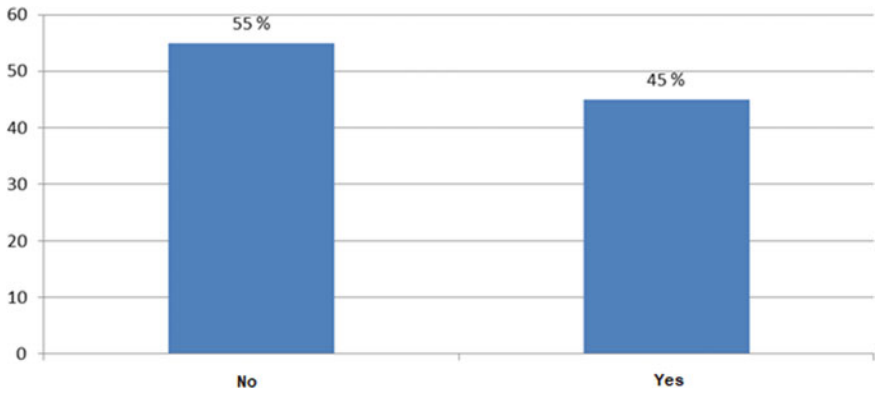

Fig. 5 Answer to the question "Are you satisfied with the system of professional motivation in consumer cooperation?" *Source* Developed by the Author

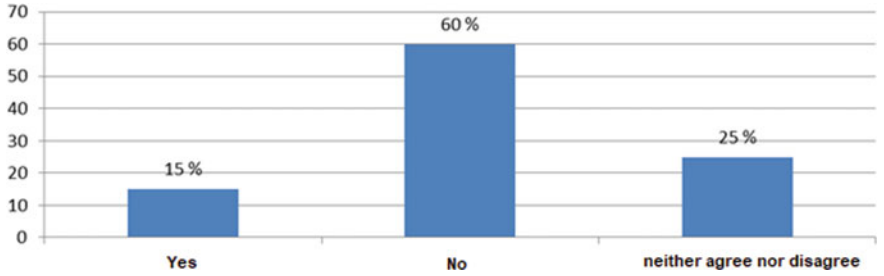

Fig. 6 "Are you satisfied with the methods of socio-psychological motivation?" *Source* Developed by the Author

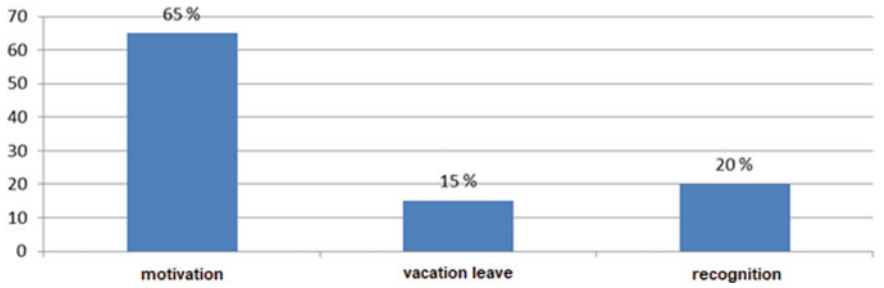

Fig. 7 Answers to the question "What types of socio-psychological motivation do you prefer?" *Source* Developed by the Author

The answers were distributed as follows: 15% are satisfied with the pay, however, most of the employees (60%) are not completely satisfied and 25% of the survey participants found it difficult to answer.

In the final stage of the analysis of the problem, the question was asked: "What types of socio-psychological motivation do you prefer?" (Fig. 7).

In such a way, 65% of respondents prefer motivation, 15% preferred the use of vacation leave and 20% preferred recognition of merit.

4 Conclusions

Based on the data obtained from the experiment, it should be concluded that the use of social privileges and certain benefits is practiced as professional motivation, among which such as training of employees of the consumer cooperation system in subordinate educational organizations and benefits for spa treatment. Non-traditional incentive methods include competitions, summing up and remuneration of employees in various professional areas. In order to improve the state of motivation of work, it is necessary to develop and introduce a grading system (Kirikutsa 2016) as an

institutional tool to increase the system of motivation in consumer cooperation, which will lead to increased efficiency, transparency of personal motivation and socio-psychological satisfaction with work.

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Foreign Language Education in Russia in the Eighteenth–Nineteenth Centuries as a Factor in the Development of Intercultural Dialogue

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Abstract The article examines the problem of mutual agreement in the development of foreign-language education in Russia in the eighteenth–nineteenth centuries and intercultural dialogue with representatives of European countries. The purpose of the work is to identify sources that give an idea of the cultural component of the content of linguistic education during this period. The research identifies subject-oriented textbooks and dictionaries that have created the basis for intercultural communication for specialists who have mastered foreign languages with a view to their practical application in the field of sciences, trade and culture. These educational publications are historical sources for studying the content, methods, techniques of teaching foreign languages, aimed at establishing and maintaining interpersonal, social and intercultural contacts in the past, which, in turn, is important for understanding from a modern perspective the processes of formation and development of international relations, including economic ones. Such publications include subject-oriented educational books for specialists published in Europe and Russia: dictionaries, textbooks, grammars, books for reading and translation, foreign-language books on history, geography and other disciplines, fiction, etc. These sources were studied using historical, logical analysis and other methods of historical and pedagogical research. The material reviewed gives an idea of the world picture formed by foreign language means as a meaningful basis for intercultural dialogue.

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Keywords Foreign language education · Textbook · History of Russian education · Linguistic picture of the world · Intercultural dialogue

JEL Code I21

1 Introduction

The value of intercultural dialogue as a factor in the development of society at every historical stage is recognized in its own way. A retrospective view of the period of formation of foreign-language education in Russia allows us to identify the socio-economic and cultural factors that influenced the course of this process, and then track how the results of this educational activity were reflected in the life of society.

The choice of the foreign language studied, the content, forms and methods of learning in each historical period are determined by the conditions of life in society, the event context, and in order to characterize the development of foreign-language learning in the country as a factor of intercultural dialogue, it is important to answer the following questions: What historical events accelerated the development of foreign-language learning in Russia of the eighteenth–nineteenth centuries? What educational publications have become the basis for foreign-language training in Russia? What is the role of foreign language training in shaping a specialist's readiness for intercultural dialogue?

The motivation for mastering national foreign languages in New Times was, as a rule, trade and military operations. So, in Germany, the Thirty Years War became a clear milestone for the study of the French language (Kuhfuss 2013), and in Russia in the seventeenth century, during periodic military clashes with the Commonwealth, during which army innovations were mastered, the influence of the Polish language became noticeable. Further, the Northern War was the impetus for the study of Swedish, and after it other Germanic languages: Dutch and German. Active hostilities throughout the eighteenth century (battles with Prussian, Polish, Swedish, French troops) dictated priorities in choosing the languages studied among Russian officers. The Patriotic War of 1812 in Russia was the impetus for the introduction of French words into the everyday lexicon of the widest segments of the country's population.

Interest in foreign scientific and technical discoveries, in cultural innovations and achievements also motivated representatives of different ages to learn new European languages. Therefore, the linguistic influence of Western countries on the life of high society in Russia by the end of the eighteenth century became quite definite, which affected official and everyday communication, on the rules of behavior and etiquette, on the vocabulary of the Russian language, on the national language picture as a whole.

A reliable historical source for the study of the linguistic picture of the world formed in this era is the educational literature used in the process of humanitarian education, in particular for the study of foreign languages. If the concept of national character and self-consciousness is the result of an external analysis of culture and

mentality, then the picture of the world is an internal view of oneself and the environment. A textbook on a foreign language introduces the reality of another ethnic group and is a kind of collective linguistic picture of the world. The identification of the national component in the content of education, including the description, explanation of phenomena and realities of a different culture, the reflection of this in the educational literature helps to understand the features of the mentality of representatives of other cultures, the specifics of their perception of the surrounding space.

The picture of the world, broadcast through a textbook, for students becomes common, and this makes it possible for everyone to realize their belonging to an ethnos, to a social group, to determine the moral and ethical values of the person and her social environment, to form ideas about stereotypes of the behavior of representatives of their nation and other ethnic groups. Through the description and generalization of concepts, the textbook classifies the studied, forms the basis, point of reference for understanding and evaluating the new, without excluding the personal aspect, that is, individual characteristics of perception. Cultural and, as a result, linguistic paintings of the world of different peoples differ in content, in the complex of basic concepts, in the volume of concepts. Using a foreign language in speech, the student transfers his communicative strategies from his native language to a foreign language, which in the process of intercultural interaction identifies him as a bearer of a particular culture.

2 Methodology

Educational literature for the development of foreign languages in the eighteenth–nineteenth centuries in Russia is a historical source for studying the thematic content of intercultural contacts of the past, which, in turn, is important for understanding from a modern perspective the processes of formation and development of international relations, including economic ones.

The research considers thematically oriented study books and dictionaries for specialists who learn foreign languages with a pragmatic goal in the field of sciences, trade and culture (Kolobkova 2020). These editions were used in educational process in the Russian Empire in the state institutions, at private schools and at home, lexicographic editions concern them: dictionaries, slovnik, lexicons, etc.; also educational books for the development of speech skills in reading and speaking: grammars, conversations, books for reading, etc. These are publications stored in Russian libraries, in archival materials of the Russian Diaspora (Sabennikova et al. 2018), in private collections.

The study of sources in the process of research was carried out on the basis of general and special historical and pedagogical methods, which include methods of historical analysis, logical analysis, comparative method, retrospective analysis, modeling and synthesis of the results of the research.

3 Results

Books as a source of knowledge about another culture, about foreign life and about a different way of life were of particular value and significance. Foreign-language books could be an occasion to study the language in which they were written. The abundance of Polish books in Russian book repositories of the seventeenth century is explained by the arrival of West Russian scholars of monks, Ukrainian scribes, the migration of the Orthodox population from Polish-Lithuanian territories, as well as the influence of Polish culture as an intermediary, "transit" between Western European and Russian. Through the book, Polish, through communication with speakers of this language of the West Slavic group, acquaintance with Polish culture developed. Tsar Alexei Mikhailovich became the first Russian ruler to allow such transformations at court in a foreign manner as Polish fashion in clothes, in interior decoration. Tsarist children Fedor and Sophia taught Polish, and, having grown up, each at one time continued to introduce Polish borrowings into Russian everyday life, which was reflected in art, architecture, and education. In Russian book publishing, the seventeenth century is characterized by an abundance of Polish translations of scientific and fiction literature from Europe. Polish influence was the first wave of Westernization of Russia: "Through Little Russia, Russia became closer to Poland, and through Poland—to Western European culture" (Alekseeva 2014). The next such wave was the influence of Dutch culture at the beginning of the eighteenth century, then German and later, starting with the era of Empress Elizabeth Petrovna, French.

In Europe in the second half of the eighteenth century, French was taught not only for utilitarian speech skills, but to a greater extent as an elegant art of conversation, persuasion, implying possession of certain cultural content, and this, in general, was compared with such skills as horse riding, dance, possession of musical instruments (Suso Lopez 2018).

Education in the age of Enlightenment was aimed at developing the mind and heart, at raising virtuous, culturally receptive personalities (Baron and Fajen 2019; Vlassov 2015), ready to master several foreign languages for the sake of science and their business. Lexicographic editions of that time were, as a rule, multilingual: three-, four-, pentagonal (Gavrilov 1781; Volchkov 1773; Peplie 1780; Trotz 1772). Many dictionaries, based on the principle of universality, gave the most complete idea of the words and terms of all sciences and arts (Furetiere 1690). Among the teaching dictionaries of the eighteenth–nineteenth centuries it is necessary to distinguish subject-oriented, in particular, for the military (French soldiers 1812; French and Russian Allied troops 1815), for merchants (Savary des Brulons 1723). Educational publications developed certain speech skills (Kriajev 1826) with emphasis on the development of written speech (Rjeutski 2019), gave an idea of the geographical realities of the country of the language being studied (Richelet 1793). Methods of teaching foreign languages have taken into account a comparative aspect in teaching (Gay 1832).

Therefore, it can be stated that foreign language education in the eighteenth–nineteenth centuries was focused on multilingual training, on the use of speech

skills in practical activities, on the development of general cultural literacy, which contributed to an effective dialogue with representatives of other cultures.

Social and economic transformations of society directly affect the development of education, in particular, education is becoming more oriented to practical activities, the social status of a teacher is changing (Ilyina et al. 2018). However, still personal qualities, general cultural and professional competencies of the specialist, his readiness for intercultural dialogue are formed in the course of meaningful communication between the subjects of the educational process. Only through communication can we learn the techniques of conducting an effective dialogue, and in business discourse in situations of intercultural communications, as before, complex speech competencies are in demand, including linguistic, country studies, cultural, ethnopsychological components, since understanding the socio-cultural context, including the idioethical characteristics of sociums, allows us to choose an effective strategy of intercultural interaction (Anashkina 2018).

4 Conclusion

The high level of education, including language training, has been and continues to be a factor in effective intercultural dialogue. Interest in the study of foreign languages in Russia among the most active part of high society intensified at the beginning of the eighteenth century, which was facilitated by an increase in the foreign policy status of the country in the world following the results of the Northern War, as well as the development of trade relations, economic ties, science, technology, culture and the arts. The need for intercultural dialogue at the State and interpersonal levels was recognized. The teaching of foreign languages was already carried out not only abroad, but more in public and private educational institutions, as well as at home. The training process took place in direct communication with native speakers, as well as on the basis of educational books published in Europe and Russia: dictionaries, textbooks, grammars, books for reading and translation, foreign-language books on history, geography and other disciplines, fiction and journalism. Therefore, learning a foreign language, students mastered historical and country-studies realities, scientific discoveries, European literature, which was a meaningful basis for communication with representatives of other cultures to solve various problems of personal, social or state significance.

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Polydiscoursivity as the Basis for the Formation of Communicative Competence of a Foreign Student in a Cooperative University

Elena A. Nikolaeva, Tatiana V. Grymzina, Radmir A. Iksanov, and Igor A. Vladimirov

Abstract The work reveals the significance of oratory and scientific discourses for the development of communicative competence of a student—a foreigner of a university studying in the Russian-speaking environment. Possibilities of development of communicative competence of students—foreigners in the mode of speech short-term projects on the basis of oratory and scientific discourse are considered; analyzed the potential of polydiscourse for the development of linguistic and non-linguistic communicative competence, the development of the cognitive and motivational sphere of a student—a foreigner as a subject of speech and (wider) educational activity. The inclusion of speech activity in educational process through formation and realization of cognitive interests, motive of self-realization and self-development is shown. An analysis of specific forms and methods of training was carried out from the perspective of a communicative approach to teaching the Russian language as a foreign language. The study used projects carried out in branches of the Russian University of Cooperation, as well as in a number of other universities in Russia as part of extracurricular circle work with foreign students. Recommendations are given on the further use, development and study of the developing potential of polydiscure education of foreign students in the Russian language in the system of higher professional education.

Keywords Teaching foreign students the Russian language · Communication method of teaching · Oratory discourse · Scientific discourse · Method of short-term projects

JEL Code A22 · I29 · Z13

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1 Introduction

The problem of finding an effective technology for teaching foreigners the Russian language for many years has been an urgent problem of linguodidactics for many years. Traditionally, in the framework of a communicative approach to the training of foreigners, conversational (household) discourse was considered as a teaching discourse. The methodology proposed and tested by the authors of the article is based on discourses of increased complexity of development—rhetorical and scientific. The use of rhetorical and scientific discourse makes it possible to significantly expand the communicative competence of a foreign student and increase his subjectivity in the educational process.

2 Materials and Methods

Theoretical analysis of specific forms and methods of training from the standpoint of a communicative approach to teaching the Russian language as a foreign language. Analysis of practical activities for the implementation of projects of oratory and scientific discourses. As the study material, projects carried out in universities as part of extracurricular circle work for foreign students were used.

3 Results

The communicative teaching technique originated in the UK in the sixties of the last century as part of the teaching of English. At the same time, Dell Hymes introduced the concept of "communicative competence" in the broad sense of the word. He interpreted it as an internal understanding of the situational appropriateness of the language. In addition, the scientist believed that it is communicative education that positively affects the formation of critical thinking, leadership qualities and positive self-esteem, as well as physical and mental health (Hymes 1972). In the eighties of the twentieth century, M. Kanale and M. Svein proposed to identify 4 main types of competence that, in collaboration with the system of knowledge and skills, form communication. The first type of competence is grammatical competence: vocabulary, phonetics, spelling, semantics and syntax (vocabulary, pronunciation, spelling, semantics and sentiment formation). The second type of competence is sociolinguistic competence (Sociolinguistic competition): the correspondence of statements in form and meaning in a specific situation to the contextual background. The third type of competence is Discourse competence: the ability to build holistic, coherent and logical statements in oral and written speech. Fourth Competency—Strategic Competency: Compensation for insufficient language knowledge through speech and social communication experience in a foreign language environment (Balykhina

2007). The birth of the domestic communicative methodology for teaching the Russian language as a foreign language (hereinafter RSL) is attributed to 1950–1960 years. Such scientists as S. G. Barkhudarov, E. A. Bryzgunova, V. G. Kostomarov, L. V. Moskovkin made an undeniable contribution to the development of the communicative methodology of the RCT. In the modern teaching method of the RCT, according to T. M. Balykhina, the socio-practical method proposed by psychologist and methodologist B. V. Belyaev is used as the main method (Balykhina 2007). In the process of learning, students are supposed to understand the meaning of lexical units and language forms used in the process of communication. The decisive factor in learning is recognized as foreign language speech practice. It is recommended to devote a minimum of educational time (not more than 15%) to the message of information about the language being studied, and at least 85% (Balykhina 2007) to foreign-language speech activities, which should be non-translational.

The modern stage of the development of the socio-practical method of teaching the Russian language to foreigners is associated with the active introduction of multimedia and Internet resources into the practice of teaching. They are used in audiences (solving online tests, viewing and discussing excerpts of films and videos) and independent work (Instagram platform) as audio and visual material, students and teachers communicate outside time through Zoom, Skype, WhatsApp exclusively in Russian. Among extra-time activities, the most productive are recognized: communication circles on a regular basis (taking into account the interests of the students themselves); organization of joint city tours or trips outside the city; attracting foreign citizens to participate in concerts and other kind of entertainment events. In the educational activities implemented within the framework of preparatory departments of universities, training is based on the text as an important element in the development of not only communicative, but also cultural competence. These are "formulating questions on the topic and conducting training dialogues based on them, compiling theses, compressing information, condensed retelling of fragments of text, retelling fragments of text using new vocabulary" (Dunaenko and Burtseva 2018).

Getting into the educational Russian-speaking environment when moving from the preparatory department to the higher education system (foreign students are included in Russian-speaking groups, they study disciplines and fulfill the tasks provided for by the training programs for native speakers), a foreign student faces discourses of increased complexity: scientific and oratory. In the educational dialogue, the teacher-student foreign takes the position of the recipient. In the oratory discourse in its various types (informational, organizational, convincing), a foreign student acts as a speaker, that is, an active subject, the initiator of communication and influence on the interlocutor.

Meanwhile, foreign students have different levels of language proficiency and many face great difficulties in fulfilling tasks of an increased complexity or creative nature. At the initiative of students in order to develop speech skills and assist in the implementation of communication projects, circles for foreign students operate on the basis of Russian universities. In the classes of the circle, a subjective-subjective approach to educational activities is implemented. An important condition

for the manifestation of communicative subjectivity in the framework of the educational process is polydiscursive space. Oratory discourse and scientific discourse are especially significant in the educational process.

Oratory discourse is a unique training ground for improving the complex of communicative competencies and developing a communicative personality in the unity of its linguistic and actual communicative component (Nikolaeva 2017).

Foreign students actively participate in socially oriented oratory competition projects, which have been held in Russian universities for several years. The student's task is to choose a socially significant topic of oratory speech, create a text of speech, prepare it for protection. The task involves the implementation of a number of requirements for speech text and speech. These are requirements for the structure of the text, for the content of the text, for the language of speech, for the contact of the speaker and the audience. Preparation for the speech takes place as part of a circle work. Foreign students, under the guidance of a teacher, study texts—samples of public speech; distinguish microthems and theses, work with keywords, parse new vocabulary, work on the pronunciation of words. Methods of stimulating listeners' attention are analyzed; learn to argue, actively use expressive constructions, constructs of expression of the modus beginning. The next stage is to learn how to convert a "dry" written text into persuasive oral speech. In the course of the class, students get acquainted with the psychological laws of perception of the text. They work with a written text of a journalistic style: simplify the syntax, remove the involved and partial turns, introduce the author's position through the use of Ya—sentences, enrich the text with rhetorical questions, exclamations. An important role is played in the text of the oratorical speech by the developed metaphors, parables, legends, striking examples and the facts of history, literature, the Russian proverbs, sayings, phraseological units. The student plunges into the worldview of the people, into the linguistic picture of the world. So it is possible to reach a new level of mastery of the language. The imagery of the language of oratory speech allows us to bring a foreign student closer to understanding the role of context in Russian communication, "when the meaning of what was said is veiled and does not follow from literally said … The true meaning of what was said is formed from inconsistencies, metaphors, connotations, i.e., it rests on the entire so-called cognitive base of a person who speaks the Russian language picture of the world, writes Balykhnina (2010).

Students pay special attention to the stage of preparation of the performance—carefully develop the "score" of the performance, select the correct intonation, tonality reflecting the author's text modality, the correct pace of presentation of the text, learn to vary volume and intonation.

The student's success in this project is primarily related to his interest in the topic of the speech. The right to choose a topic actualizes the student's subjectivity, awakens his personal attitude to the project. This motivates him to search for "points of surprise" in additional material, to take into account the addressee factor in the unity of the verbal and non-verbal component. Then comes the skills of self-presentation, greeting and representation of the audience, the open pose of the speaker, the special communicative state of the leader. An example of the successful development of oratory discourse is the performances of foreign students of the

Kazan Cooperative Institute at the Republican Olympiad in Russian among foreign students of the Republic of Tatarstan, awarded prizes and awards.

Scientific discourse is especially significant for any university student. This is a discourse subject to strict logic and stringent requirements of the scientific style. Before the upcoming work on the course study, propedeutics are needed. The purpose of a propedeutic occupation on scientific discourse with foreign students is to learn how to write a scientific article; the result of the occupation is a small scientific article of the student, created according to the requirements of the Russian Science Citation Index, i.e. with a high degree of originality. The main focus of the created text is to reflect the study of the issue on the basis of the latest scientific literature and express your own view of the scientific problem.

Work on a scientific text by university students is included in the verbal work system on text-producing competence: this is the study of the styles of the Russian language, the peculiarities of the scientific style, the study of the norms of the Russian language (knowledge about the lexical norm and its violations is needed here), knowledge about the text, its features and structure.

Knowledge about the terminological apparatus of scientific research is also needed here: relevance, scientific problem, hypothesis, scientific novelty, research goals and objectives, methods of scientific knowledge. In this regard, we consider it advisable to conduct such classes with foreign students in the second half of the first semester. Let us consider the main stages of the work on training in writing a scientific article.

1 stage of work—the teacher indicates the requirements for the language of scientific works, introduces the general structure of the scientific article. Draws attention to the specifics of the annotation, features of the reference apparatus of the article, drawn up in accordance with GOST R 7.0.5-2008.

We need to remind you of the requirements for the text of the article. The originality of the text should be over 80%, it is mandatory to use the latest literature—scientific articles from electronic libraries.

Stage 2—search for scientific information. The teacher introduces students to electronic scientific libraries, is carried out exit to the sites cyberleninka.ru, elibrary.ru. Students master the gadgets of these libraries, learn to find scientific information, evaluate its significance, draw up a bibliographic link, and select and accumulate scientific information. At this stage, the passive hearing of the instructor's briefing goes into the "active doing" phase.

Stage 3—"immersion" in scientific discourse. Students choose a scientific topic that arouses their cognitive interest. They go to electronic libraries, choose articles of recent years, read annotations, select information that they need to write their own article. This stage is very significant for the development of cognitive processes of a subject of intellectual activity. "Work with the scientific text assumes his understanding, synthesis, summarization, comparison of various provisions and commenting, receiving and structuring new knowledge and also the solution of any problems and questions by means of information obtained from the text. Such cognitive processes as logical processes should be especially distinguished: conclusions, concretization, generalization, separation, complement, writes Kurkina (2018). This stage is also significant for the development of text-producing competence. Students

see samples of articles already accepted for printing, get acquainted with their annotations, the structure of the article, pay attention to the introduction and conclusion, write cliché phrases, work out phrases for entering new information, entering intermediate and main conclusions.

Step 4—Create your own text. Undoubtedly, this work is aimed at summarizing the views already expressed by other researchers. Students learn to formulate their own assessment judgments for scientific discourse, taking into account the limits of the scientific style on emotional evaluation tools. You are writing your own text. Then you edit the text, get rid of repeated repetitions, eliminate logical failures. The design of the reference set is mastered. Students work in the Antiplagiarism system, check the originality of their own text.

Stage 5—students write an annotation on their own article and keywords. When writing an annotation for the first time, you need to take into account that the text of the annotation is meaningful—conceptual information, it has a generalizing character and the effect of "detached" authorship, so the cliché text uses impersonal constructions and keywords of the article. Each student works at an individual pace, so the readiness of the article by the end of the class is different. We draw attention to the main structural elements of the article, the presence of abstracts, references and the design of the list of literature. The volume of the article can be increased at home. Usually, during a two-hour class, a student creates several paragraphs of scientific text. The first creative contact with generation of the scientific text causes in students—foreigners feeling of novelty and success in development of a role of the scientist, new to them, the researcher. The process of work is colored by positive emotions and pride in the result. Articles written by the student during the circle work are published in collections of student scientific papers, and form the basis of speeches at student conferences.

Results of the study. In the mode of short-term speech projects, on the basis of oratory and scientific discourse, there is an intensive formation of communicative competence of foreign students in the unity of the linguistic and non-linguistic component; development of the cognitive and motivational sphere of a student—a foreigner as a subject of speech and (wider) educational activity. Speech activities are actively included in the educational process, including through the formation and implementation of cognitive interests, the motive for self-realization and self-development.

4 Conclusion

Therefore, oratory and scientific discourse are among the most sought-after in the communicative—value space of the university. Training in oratory and scientific discourse is necessary and possible to begin from the first months of study of a foreign student at a university within the framework of a scientific circle. This is important for the development of the subjectivity of the student of the vocational education system. When a student is "immersed" in scientific and public speech

activities, his subjectivity (scientific goals, scientific interests) will be maximally realized, the cognitive interest of the subject of study will be updated. The result of the student's activity—a small scientific article or speech—is subject. In the process of mastering scientific discourse, there is training in the skills of scientific activity itself (scientific targeting, summarization, etc.), training in cognitive operations (generalizations, concretization, analogy), and training in text creation skills. Mastering oratory discourse increases the competitiveness of the individual, teaches you to believe in yourself and defeat communicative barriers, to form communicative behavior in accordance with the requirements of society.

Further use, development and study of the developing potential of polydiscure teaching of foreign students in the Russian language in the system of higher professional education is recommended. It is necessary to develop and implement diagnostic methods for supporting the process of polydiscure training of foreign students, as well as to expand the range of projects on a discourse basis.

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Methodological Features of Distance Education: From the Experience of Teaching at an Economic University

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Abstract Various methods of distance learning are considered as an alternative to traditional methods of learning. This is due to the fact that recently, for objective reasons, distance learning is increasingly in demand in higher education, which is not an absolutely new form of education, in any case, for modern universities, however, cannot be defined as traditional. Special attention is paid to the organization of various types of classes, monitoring of training results. The experience of using a variety of methods in distance learning at our university has shown that only a skillful combination of these methods allows you to professionally interest a student, encourages him to independently master knowledge under the guidance of a teacher, and ensures a high level of formation of professional competencies. Such training prepares for difficult situations in the profession, develops the speed of professional reaction to economic situations, develops techniques for accumulating the received professional knowledge, removes time and spatial restrictions, expands the communicative sphere of students and teachers, solves the psychological problems of the student.

Keywords Distance · Distance learning · Method of individual learning · Research task—to the trainee · Data array—to the array of trainees · Principle: "problem—to the trainees" · Chat classes

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JEL Code Economic development · Innovation · Technological change and growth

1 Introduction

Recently, for objective reasons, distance learning is increasingly in demand in higher education, which is not an absolutely new form of education, in any case, for modern universities, however, cannot be defined as traditional education. This means that the teaching staff, having mastered the distant, accumulates some experience in using this form of training in professional competencies.

The use of distance learning in our practice of university education allows us to share the established understanding of the possibilities of this form of transfer of knowledge and the prospects for its use in the training of professional economists.

2 Materials and Methods

In our opinion, the remote form of training is training using modern information technologies. By defining the Distance, we will allow ourselves to disagree with the methodologists who define distance learning as distance learning, since information technologies are precisely designed to reduce this distance and ensure live communication between the student and the student.

Distance learning is based on the ability of the teacher to use the totality of pedagogical methods and techniques in the educational process. It is no coincidence that the classes conducted in a remote form aim the teacher at additional training, consisting, first of all, in carefully considering and planning the conduct of a separate lesson, and rethinking the entire course of the training discipline (module).

At this stage of using distance learning, there is a lot of scientific literature of foreign authors, domestic methodologists, whose work varies not only in understanding the definition of distance learning, but also in understanding how this form of learning can be built into the educational process and what is most important in the distance. This study is based on works of the such authors as: Sharipov and Ushakov (2020), Sylvestrova (2005), Michurova et al. (2020), Fedorova (2015), Fedorova et al. (2018), Andreev et al. (2017). The authors also used the materials from Hope Kentnor Distance Education and the Evolution of Online Learning in the United States (2015) in this study.

In addition to studying the relevant methodological literature on this topic, the authors of the article, using a questionnaire, found out the opinion of university students on distance learning. In general, respondents liked this form of training. The disadvantages include the student's independent work on the material, which the teacher places in the electronic educational system.

In this regard, we decided to share our understanding of the use of distance learning in the training of specialists at our university.

3 Results

We consider it necessary to attribute to the main methods widely and successfully used in distance learning the following methods:

- the method of presentation of educational material by the teacher on the principle: "one—to the array of trainees";
- method of individual training on the principle: "one—to—one";
- method of inter-subject training according to the principle: "array of trainees—to the array of trainees";
- active training method according to the principle: "data array—to the array of trainees";
- problem training method according to the principle: "problem—to trainees";
- method of projects on the principle: "independent activity of the trainee";
- research method on the principle: "research task—to the trainee."

The experience of using these methods in distance learning at our university has shown that only a skillful combination of these methods allows you to professionally interest a student, encourages him to independently master knowledge under the guidance of a teacher, and ensures a high level of professional competence formation. Experience is important here, which does not exclude the use of the experiment in the teaching process, when the same topic of the lesson is carried out using various methods, taking into account the level of preparation of the audience (secondary vocational education, undergraduate, specialty, master's degree, graduate school). At the same time, the teacher cannot allow oversaturation of classes by various methods of training, since the principle should work: "the complexity of the material is the method of training." Otherwise, the purpose of the lesson will not be achieved. It is no coincidence that we have now applied the concept of "occupation," because any distance communication between a teacher and a student, even if it is a fifteen-minute consultation, is an occupation built on cooperation. Any online meeting involves all the components of the lesson: goals, tasks, content, methods, organizational forms, learning tools. Experience has shown that the most productive forms of online cooperation are the following: problem training, project training, setting a research task.

Problem learning always involves the formulation of a difficult cognitive task, which has theoretical and practical significance, when the student, led by the teacher, finds solutions to the problem.

Project training allows the student to show the greatest independence in educational and cognitive activities, forces him to independently form his knowledge, as a result, to offer a certain product that should be evaluated by the teacher.

Research training is based on the use of a set of scientific research methods, methods of processing and processing results, develops and consolidates the research skills of trainees.

Distance learning requires skillful use of web and chat classes. Web classes include all remote forms using web forums using entries made on one of the sites with the program installed on it. The use of web forums is justified if a large amount of information is offered, which it is advisable for the student to master independently. The information offered on the web forum can be designed to repeat knowledge, to deepen it, to obtain advanced knowledge. As a rule, the material proposed on the web forum should be discussed both preliminary and on familiarization with it. Otherwise, the goal of providing material to the trainee will not be achieved. Web classes are characterized by longer multi-day work and represent the asynchronous nature of communication between the teacher and the student. It follows from the experience that web classes are aimed at a student who knows how to study. Since in this case, the responsibility for mastering the material is assigned to the person trained on the principle of self-training and implies the presence of an individual training rate.

Chat classes are held synchronously, all parties to the training process have simultaneous access to the chat, getting the opportunity to communicate at the same time in German. It should be borne in mind that these classes involve a large load on the teacher and the student, the leading one involved in the training process is the teacher, he provides a perception of professional knowledge "through himself."

Our experience shows that chat classes can only be supplemented by web classes and should account for the largest proportion of hours. Since the effectiveness of distance learning is achieved only in the case of a combination of synchronous and asynchronous training methods. In our opinion, the effectiveness of any type of distance learning consists of three main skills of the teacher:

- use appropriate pedagogical technologies;
- provide interaction between the teacher and the trainee (feedback);
- use methodical materials and possess methods of their delivery.

A separate methodological understanding requires a lecture in remote conditions. Lectures, which are the basis of training at the theoretical level, form further guidelines for students for the practical application of the studied material. In this regard, lectures remain relevant types of classes for distance learning, while the teacher needs to maintain the traditional foundations of the lecture: its structure, a clear presentation of material using practical examples, communication with the audience of students, the emotional interest of the teacher, prompting the appearance of professional interest among the student, etc. Experience shows that a hundred distance lecture has a number of advantages: the use of modern information technologies makes lectures expressive and visual. Such lectures can be listened to at any time and at any distance. In addition, you do not need to inspect the material.

The lecture achieves the greatest effect when it encourages the student to work independently. The student's independent work requires thoughtful consultations.

An important part of distance learning is knowledge testing. Today, test control is widespread. However, our experience shows that this control method is effective when the results of the test control are carefully analyzed by the teacher. The teacher not only puts up points, but also argues them, and tells the student what material they do not learn enough. Test tasks should be formulated according to a certain logic from simple to complex, they should not stimulate mechanical memorization of the material. This is not just not productive, but develops in the student an indifferent attitude to the comprehension of the subject of study.

It is accepted that the cost-effectiveness of distance learning is characterized by its low cost due to a more concentrated presentation and unification of the content of the course, more students, more efficient use of space and technical means. However, the teacher's work in the process of preparing and conducting online classes increases at times and assumes the presence of a relationship between the teacher and the student at any request of the latter. Under such conditions, a flexible combination of the independent activities of the trainees and the leading role of the teacher in the training process is not always possible. At the beginning of the development of any discipline, significant participation of the teacher is necessary. In this case, the information flow goes from the teacher to the student, from the teacher to the whole group, from the whole group to the teacher. Here it is appropriate to divide information flows into two levels: constant and variable. The constant information flow consists of curricula, basic textbooks, manuals, recommendations about studying a training material, questions for self-checking to the constant information flow, etc. The variable information flow includes all educational materials and correspondence from the teacher to the trainee, from the trainee to the teacher. However, we believe that the constant information flow is relatively constant, because it needs to be updated, supplemented, improved and it is necessary to introduce the student to the methods of its use.

Among other things, a distance course requires a teacher to:

- interpret of general information about the course, its purpose, goals, tasks, course logic, blocks of tasks aimed at assimilating the material, forms of control, parameters of assessment of formed competencies;
- prepare of actual material;
- take into account students and distinguishing their individual abilities in the assimilation of material in distance form;
- ensure relevant and active educational activities;
- flexible combination of students' independent cognitive activity with educational material existing in this module;
- use of problematic research methods in the course module;
- development of visual material, provision of multimedia presentation of educational information.

Only in this case, the teacher can be sure that the student will master a certain amount of knowledge, learn how to acquire it independently, work with information, master the ways of educational activity and will be aimed at continuous self-education, the use of the acquired knowledge to solve problems in his professional activity.

Modern distance learning is carried out, as is known, as part of modular training, when the distance course consists of training modules. In this regard, the development of network modular courses is relevant, which requires standardization of network training tools, technological educational systems, the availability of methodologies for adapting to international systems in the field of training information systems technology.

Distance learning in the higher education system allows you to increase the qualifications and retraining of practitioners through the system of additional education, as well as offer additional education to a student. In this regard, the material offered by the teacher should convince the student that modern practical activities require a large amount of knowledge from the economist at the junction of several profiles.

Distance learning makes it possible to attract as students people of all ages living in regions remote from university centers, specialists in dire need of acquiring new knowledge, in obtaining a second education, people who are not able to receive educational services in the traditional education system (for one reason or another) who cannot combine studies with work, persons serving in the armed forces, students of foreigners, etc. This means that distance education carries a certain social burden, and the teacher performs a certain social mission, which unconditionally must be burdened.

4 Discussion

In this article, we tried to set out only some aspects of the capabilities and methods of applying distance learning. It is likely that our point of view will not be accepted by all faculty an d will cause some discussion, which we will be very pleased with, but believe that both theorists and practitioners, support us in the fact that d o requires special training and the ability of both the teacher and the ability to independently interest the student, and forms and methods of distance are determined by the complexity of the module theme and the readiness of the audience for self-work.

5 Conclusion

Therefore, the distance learning system has a number of advantages over the traditional form of training. The distant guides the student on an independent creative search in achieving the necessary knowledge, and modern technologies are optimally suited for the educational process. “The need to turn the system of higher

education from the formula" education for life "to the formula" education for life (Sharipov and Ushakov 2020), which we fully share, is becoming increasingly obvious, because professions are dynamically developing, economic situations are unstable, the development of business processes is intensive.

Such training prepares for difficult situations in the profession, develops the speed of professional reaction to economic situations, develops techniques for accumulating the received professional knowledge, removes time and spatial restrictions, expands the communicative sphere of students and teachers, solves the psychological problems of the student. Distance learning helps to obtain education regardless of social status and financial situation. The basis of such education, in our opinion, should be the principle of student independence and activity.

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On Multi-vector Education in an Educational Institution of Cooperation

Vladimir V. Dudukalov, Galina N. Dudukalova, and Oxana V. Kravtsova

Abstract The purpose of the research is to establish approaches to identifying the connection between the education of a participant in the cooperative movement and patriotic education in the conditions of the educational organization of cooperation and the economic activity of the existing cooperative. Based on the dialectical methodological approach, the authors use the empirical method of observation, the theoretical method of comparative analysis and the historical method to analyze possible problems and prospects of patriotic education and education of students as future participants of the cooperative movement, which promote and ensure the sustainable integrated development of rural areas and effective economic activity of consumer cooperation.

Keywords Globalization · Cooperation · Patriotism · Education · Cooperative movement · Sustainable development · Economic efficiency · Cooperative education

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1 Introduction

Globalization, despite attempts to slow it down, continues to be the cornerstone of human civilization. International cultural exchange is increasingly developing, business communications are developing, and integration processes are actively underway in business and politics.

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Unfortunately, globalization has its negative effects. Some members of the world community, under the guise of globalization, are trying to impose their standards of living, the stereotypes in these countries in politics and the economy. These standards are largely alien to the world community and can be imposed by very inhumane force methods, which the world community is trying to disavow. In Russia, globalization from a position of strength, according to the authors, was unacceptable, we cannot accept Western standards, although we are ready to cooperate on the basis of respect for other peoples and religions. This trend towards cooperation did not appear yesterday, it is many years old and at all times in the ideology of Russians there were tendencies to get the best out of cooperation with other countries and peoples. This happened with consumer cooperation, which appeared as a form of economic management from Western Europe.

Consumer cooperation has been active for many years in Russia for the benefit of its shareholders and the population, being a kind of counterweight to globalization, defending the interests of people at the local level.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as Dudukalov and Dudukalova (2019), Evdokimov (2020), Zimnyaya (2003), Morozov (2004), Kropotkin (1922) and Chayanov (1925).

The authors also used the materials from Resolution of the government of the Russian Federation of May 31, 2019 No. 696 (2019), The law "on education of the Russian Federation" (2014), Creators of cooperation and their Dumas (1919), Federal law of July 31, 2020 No. 304-FZ "on amendments to the Federal law" on education in the Russian Federation "on the education of students" (Federal Law 2020) and Proceedings of the First All-Union Meeting on Cooperative Education (1926) in this study.

2 Materials and Method

When carrying out a research by authors the dialectic methodological approach on the basis of fundamental laws of dialectics is used: law of unity and conflict of opposites, law of denial of denial, law of transition of quantitative changes to high-quality changes. The authors used an empirical observation method, a theoretical method of comparative analysis and a historical method in a scientific study.

Cooperation as an original economic system is based on certain requirements for people who engage in cooperative activities. Requirements are reduced to following certain rules, formed on the basis of value guidelines, for example, such as mutual assistance and mutual responsibility. These values of the participants in the cooperative movement do not arise from nowhere. They require work to educate future cooperators, both in the conditions of educational organizations of cooperation and in the conditions of economic activity of the cooperative.

After thirty years of oblivion, education is again revived as an element of state policy, prescribed in law.

Currently, in education, including in educational organizations of cooperation, much is said about multi-vector education—this is environmental education, physical, volunteering, and other types of education.

The upbringing to which the state wants to return or rebuild is:

1. Religious education,
2. Civic and patriotic education, volunteering,
3. Military—patriotic education, service to the homeland,
4. Physical education, healthy lifestyle,
5. Environmental education,
6. Economic education,
7. Counteraction of extremist activity.

Comprehending these education vectors as a whole comprehensively, the authors suggest the opportunity to say that this is all patriotic education in the broad sense of the word. Such education, which should also be in educational organizations of cooperation, because they are subject to state requirements for the training of specialists for the national economy.

The goal in patriotic education is determined by the fact that in the global world, Russia as an independent state will not be able to exist without relying on the patriotism of its citizens.

What is patriotism in general. Obviously, it is possible, without looking into the dictionary, to define it as a love for the homeland, a feeling opposite to cosmopolitanism. However, what specifically this feeling may manifest is not entirely clear. Obviously, any person loves his home, seeks to equip it in such a way that he is comfortable for the life of the person himself and his children and grandchildren.

If the concept of a house is considered in a broader context, that is, not only as a dwelling, but also as the microenvironment that surrounds this house, then, according to the authors, a sufficiently large number of components should be included in the concept of a house—the natural environment, people (neighbors, friends, acquaintances), household (economy), the desire for conservation, improvement in the interests of future generations. In fact, all this forms the basis of the concept of sustainable development proposed at the time by the Club of Rome.

Currently, a program for the integrated development of rural areas has been approved in Russia. It would seem that in the context of urbanization this has no historical prospects, however, the great agrarian power, our country, a food producer, successfully solves not only its food problems, but also actively takes part in solving the global food problem of the world's population. Decree of the Government of the Russian Federation of 31.05.2019 No. 696 "On the approval of the state program of the Russian Federation" Integrated Development of Rural Territories gives an additional subject of pride and application of the hands of participants in the cooperative movement within the framework of public–private partnership.

3 Results

In the educational organization of cooperation, from the point of view of the authors, cooperative education should take place, since the task of any educational institution is to reproduce personnel, and only cooperative education can achieve this goal. The main question of cooperative education: does cooperative education contradict state requirements for education.

Cooperative education in the modern educational institution of the cooperative is extremely superficial, this can be explained by a variety of reasons, but the main reason is the outdated, in our opinion, opinion of educational activities as a very profitable business. It is based on the opinion of the first cooperators about the need to "care for the community." A very small number of graduates go to work in cooperation, and the number of graduates who create cooperative enterprises generally tends to zero. Apparently, this explains the desire to fulfill, first of all, state requirements for educational activities. As for the needs of cooperation for the training of the participant in the cooperative movement, the person creating the cooperative, they fall into the background.

Therefore, the authors propose the introduction into the practice of educational organization of cooperation of a cooperative education system that meets the needs of cooperation and strengthens the meaningful orientation of the graduate.

In cooperative education, there is an opinion that the study of the subject "Theory and practice of cooperation"/"Current problems of cooperation" can form competencies that allow a graduate to promote cooperative ideas, attract new participants in the cooperative movement, and work in cooperation.

According to the authors, this is far from true. The model of the process of educating students of the educational organization of cooperation as participants in the cooperative movement, like any other vector of education, includes four stages: informational, emotional-evaluation, personality-semantic and behavioral, and the presence of a personally semantic stage is mandatory. Unfortunately, the results of studies indicate that when studying the above educational disciplines, the personal meaning component and, as a result, the behavioral component are absent. The result—the person knows, has acquired the knowledge, owns it, but still does nothing about it!

The training of the student of the educational organization of the cooperative for work in the cooperative should now be comprehensive and consist of a number of activities that include not only a cognitive component, but also specific actions aimed at involving new shareholders in the cooperative movement, creating new cooperatives, attracting new students to educational organizations of the cooperative. Such training can be carried out through a set of specific activities, including the allocation of synergies in the vast majority of courses, the development and implementation of a special course on cooperative relations among people, as well as cooperative courses already existing in the curricula.

In addition, such training can be implemented through a system of educational activities, we can talk about any activities, the main thing is to focus the attention of students on its synergistic component. The relations that have developed between teachers, the administration and students in building a system of public co-government in the educational organization of cooperation should also be considered important. Another of the measures designed to ensure the effectiveness of the process of preparing students for cooperative work is the creation of a diagnostic system for the activities carried out to determine the levels of education of students, according to the criteria developed by us.

As noted in his study Makhnovets (1917) in the brochure "Cooperative courses abroad," the goal of cooperative education approved by cooperators in 1911 at the congress of cooperation requires, through teaching economic theory and the history of industrial development, to form a cooperative character and beliefs, as they contribute to the emergence and development of cooperation and also orient citizens to participate in civil life and economic reforms.

Almost two hundred years ago, the charter of the Rochdale Cooperative, which still exists, recorded the requirement to educate a participant in a cooperative society, as well as the promotion of sobriety.

Zhid (1909) introduced twelve commandments of cooperation into economic science, including the need to emancipate the people through education, referring to the liberation of people from various social dependencies and phobias.

Tugan-Baranovsky (1989) pointed out that the cooperative economy necessarily requires the education of each individual. Investing heavily in raising the spiritual and moral level of citizens, creating educational institutions, libraries, courses, museums, organizing lectures, cooperation pursues not only idealistic goals that are characteristic of it, but also follows its extremely important and understandable economic interest. The fact is that in order to achieve its own economic goals, cooperation must form a person who is able to serve and recreate it.

The beginning of cooperative education was laid by a meeting on cooperative education, where Krupskaya (1926) indicated that cooperatives are needed by workers who understand the importance of cooperation as an economic and social system.

Kilchevsky (1917) points to the components of cooperative education. He believes that this education should be public, that is, public interest should become part of the person's personality, and a person would receive satisfaction from maximum inclusion in public affairs and public interest. Such a result of education, according to Kilchevsky (1917), can be achieved through conversations on social science and ethics.

The works of the classics of cooperative education at our disposal, despite rather clear indications of the need for such education, still do not have clear indications of all components of the educational process, which allows organizing the training of the cooperator in a modern educational organization.

4 Conclusion

Therefore, how are the authors currently seeing the basis of cooperative education? The basis of education, according to the authors, is seen, first of all, on the basis of the idea of sustainable and integrated development of rural territories, the fulfillment of the social mission of the cooperative, public–private partnership of cooperation and the state. All these ideas, according to the authors, have a pronounced patriotic component and, thus, the authors believe that it is necessary and possible to implement both patriotic education and the education of participants in the cooperative movement, which will strengthen and complement each other.

In such a way, according to the authors, cooperative education contributes to development and strengthens patriotic education, and, therefore, such education is obliged to be present in the educational organization of cooperation. It strengthens cooperation, creates the conditions for the effective economic development of cooperation and the possibility of confronting the unpredictability of the global world.

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Using the Logistics Approach to Assessing the Competitiveness of an Enterprise

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Abstract The article substantiates the relevance of the development of the marketing logistics system, the logistics approach to assessing the competitiveness of the enterprise, as well as solving methodological problems of managing logistics business processes and meso-competitiveness. In order to identify its specifics and indicators, study its impact on the economic efficiency of the enterprise, a comparative analysis of the experience of companies practicing marketing and logistics tools for assessing and ensuring competitiveness was carried out using methods of theoretical and empirical research, systemic and statistical analysis. The company's competitiveness assessment was carried out on the basis of a set of indicators, including marketing and logistics processes. They made it possible to define logistics guidelines as a scientific and practical activity for safe strategic management of enterprise competitiveness in order to minimize logistics costs and commercial risks, optimize the company's logistics system and increase its profit and profitability. The need to integrate the groups of practices used in assessing the competitiveness of an enterprise as a link in the supply chain is justified.

Keywords Logistics · Logistic activity · Marketing · Competitiveness of the enterprise · Competitive advantages

JEL Codes M30 · M210

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1 Introduction

In the current conditions of increasing instability, the changes taking place in the Russian economy have a great impact on the economic situation of enterprises, aggravating their low competitiveness. In the Competitiveness Index, which assesses the competitiveness of the company and the quality of the national business climate, Russia occupies modest positions (Alexandrova and Munshi 2020). In conditions of increasing intensity of competition formation and development of system of interaction of logistics and marketing is the factor of improvement of efficiency of activity of modern enterprise, contributing to development of strategy of provision of its competitive advantages (Lubochnov 2009).

Being an exclusive value in the context of competition in the form of superiority relative to competitors and possession of demand (privilege in the eyes of the consumer), they manifest themselves in realized environmental conditions. The properties of competitive advantages (competitive nature or the presence of competitors, their low ability to reproduce a product/service, relative nature, exclusive value and compliance with consumer requirements) are reflected in the characteristics of the competitiveness of the enterprise. The main source of sustainable competitive advantages is the consolidation of existing technologies and skills into key competencies that ensure the formation of value in the consumer system while identifying their needs and constantly tracking the actions of competitors.

Thus, from the point of view of marketing logistics, the consumer "gives" an assessment of competitiveness. It determines how competitive an enterprise is in terms of the degree of satisfaction of its needs and the level of their importance. Consumer orientation is the basis for identifying and evaluating the competitive advantages of the enterprise. Marketing analytics explores and predicts customer needs; logistics tools allow synchronizing the flow of goods and services in time and space and timely meeting the demand identified by marketing (Aleshina et al. 2019). Since each market has its own target audience, the practical issues of assessing competitiveness must therefore be market-specific. This determines the relevance of the study of the methodological basis of competitiveness and the application of a logistical approach to its assessment.

2 Materials and Methods

The development of a methodology for assessing the competitiveness of goods (it's micro-level) to date has some achievements. However, there is no universal methodology for the integrated assessment of meso-competitiveness (at the meso-level, the subjects of competition are individual enterprises, firms, their corporate associations), which allows you to choose regional measures to support the enterprise. Analysis of its evaluation methods (complex, points, matrix, graphic, etc.) showed that their shortcomings lead to limited possibilities for practical application. In our opinion,

the development of the system of interaction between logistics and marketing can be considered as a condition and factor for ensuring the competitiveness of the enterprise, which allows us to apply a logistical approach to its assessment.

In the practice of entrepreneurial structures, the implementation of marketing and logistics functions, the quality and timeliness of which affect the competitiveness of the enterprise, begins to take on great importance. This is due to the fact that the connection of market economy tools—logistics as a streaming and marketing as a market management concept—creates additional opportunities to increase the usefulness and value of the product to the consumer.

Competitiveness as a complex multilevel concept is studied by many scientists (Zaitsev G., Mikhailov O. V., Porter M., Chandler A., etc.). It has been the subject of study for many years and does not cause disagreement among theorists and practitioners today. It is defined as a complex characteristic of the business entity, reflecting its advantage in relation to other enterprises of the industry, its superiority over competitors in terms of financial, economic, marketing, personnel and other indicators. The competitive advantage of one enterprise over another can be appreciated when both enterprises in related market segments offer customers products that meet functionally close needs.

The diagnosis and assessment of competitiveness level is the most important indicator, both for the purpose of government regulation of markets and for the development of corporate strategy in these markets (Mikhailova and Gavrilova 2020; Alexandrova et al. 2021). The sequence of calculation of enterprise competitiveness parameters is as follows: competitiveness of products, enterprises, industries.

Therefore, system analysis, as a basis for assessing the competitiveness of an enterprise, allows you to consider the subject of the study as an integrated logistics system, even if it consists of individual disconnected components. Due to it, the regional network of enterprises is distinguished by a well-functioning system for promoting goods and synchronizing product flows.

3 Results

Logistics is a scientific and applied area that has the ability to increase the efficiency of the enterprise's economic activities; A management system covering procurement, supply, transport, warehousing, finance and information.

The logistics approach to assessing the competitiveness of an enterprise consists in the following: the systematic management of material, information, financial, labor, transport, service and other flows; synchronization of flow processes from the moment of purchase of raw materials required for production to the moment of final product receipt by final consumers; optimizing the costs associated with the movement of logistics flows; integration of logistics, production, transport, marketing and transfer of information on the movement of goods and materials into a single system; integration of supply, supply and marketing management systems; Achieving the result with the lowest cost possible in these conditions. The systematization and

study of the costs associated with logistics can be considered one of the key elements of the management of the logistics system, their level is a competitive indicator of the enterprise.

The peculiarities and advantages of the logistics approach to the assessment of the enterprise's competitiveness are manifested in the formation of partnerships, the creation of the enterprise's logistics links with components of the external environment, that is, links of the logistics chain, from which logistics channels and systems are formed, as well as in interaction with marketing. The development of the relationship of logistics (the basis for the implementation of the marketing strategy) with marketing (the basis for the formation and optimization of the logistics system) as a demand-driven supply chain can be determined by four factors: "product," "price (cost)," "place" and "potential" (Alexandrova and Munshi 2020).

The connections between the two areas of business are so intertwined that it is difficult to separate them. Since the logistics component is the "finish" in economic efficiency, despite the desire for parity in the relationship between marketing and logistics, it begins to dominate the assessment of competitiveness. This allows you to highlight the logistics approach to assessing the competitiveness of an enterprise.

The integration and socio-economic mechanism of the relationship between the two management concepts is at the heart of marketing logistics—an integrated planning system (marketing) and the organization (logistics) of the presentation of goods of the necessary quantity and quality, for which profit-generating demand is presented, at the right place and time, at optimal prices and with minimal costs. Marketing logistics is responsible for the generation and implementation of this demand.

Taking into account changes and meeting demand, therefore, is possible with an established logistics system that complements and develops marketing, "connecting" the consumer, transport and supplier to a mobile coordinated system with feedback with a single technology. Both tools solve different problems, and their sharing can guarantee and increase the efficiency of the enterprise.

4 Discussion

Despite the fact that each company chooses its own approach to assessing competitiveness, different groups of practices are distinguished. The logistics approach to assessing the competitiveness of an enterprise involves defining the field of the functional application of logistics and marketing processes (Alexandrova and Munshi 2020).

As we see, the areas of functional application of analyzed processes are determination of resource sources, customer service and sales of goods and services. They form the basis of a comprehensive assessment of the competitive position of the enterprise.

Let's consider the peculiarities of development of system of marketing logistics and assessment of competitiveness of production enterprises. The results of analysis

Table 1 Generalized scoring of marketing processes efficiency using the example of LLC "2-C"

Marketing processes	Allocation of scoring points					
	0–15	16–35	36–50	51–65	66–85	86–100
	Critical	Low	Satisfactory	Average	Above average	High
Conduct marketing research			+			
Managing the assortment of goods and services, developing new services				+		
Customer service, maximizing customer satisfaction			+			
Pricing management			+			
Distribution management		+				
Manage merchandise promotion		+				

Source Alexandrova and Munshi (2020)

of marketing (marketing research, pricing management, etc.) and logistics (logistics research, inventory management, etc.) processes are presented in Tables 1 and 2.

The assignment of the process effectiveness assessment was carried out by experts in points and had the following value options: the process is very effective (66–100 points), effective (51–65), satisfactorily effective (36–50), poorly effective (16–35), not effective (0–15). A score assessment of the efficiency of the enterprise's processes showed that its marketing (237 points) and logistics activities (211 points) are not effective enough. The company's positions are weak both in the field of marketing and logistics, so we do not have to talk about the marketing logistics system, the use of its tools in practical activities and the effectiveness of the application of the marketing logistics system in LLC "2-C".

The study allows you to determine the specifics of the logistics approach to assessing the competitiveness of the enterprise and the conditions for its improvement. For example, to strengthen the competitive position of the analyzed enterprises, it is necessary to create a system of interaction between logistics and marketing, which will achieve a synergistic effect of integrating the analyzed processes and increase the efficiency of activities. Separately, each of the processes cannot fully realize the necessary functions (study the market, take into account its changes, optimize the flow of flows aimed at achieving the maximum adaptation of the enterprise to a changing market environment with minimum costs). The marketing logistics system will allow you to organize the reliability and security of the supply taking into account the current perception by consumers of the product and/or service and the forecast of resource needs, reduce the vulnerability of the business to changes in

Table 2 Generalized point assessment of logistic processes efficiency using the example of LLC "2-C"

Logistics processes	Allocation of scoring points					
	0–15	16–35	36–50	51–65	66–85	86–100
	Critical	Low	Satisfactory	Average	Above average	High
Logistics research (study of transport network of service region, etc.)		+				
Select suppliers				+		
Provide the required level of logistic service		+				
Establish logistics cost-based service standards			+			
Estimation and selection of distribution channels		+				
Inventory management			+			

Source Alexandrova and Munshi (2020)

economic variance. It will assess and strengthen the competitive advantages of the enterprise.

Therefore, the presentation of marketing and logistics as a single system will solve the problems and areas of application of the logistics approach to the assessment of the competitiveness of the enterprise, as well as issues of evaluation and development of the marketing and logistics system of the enterprise (development of electronic channels of marketing and distribution, increasing the area of responsibility of participants in procurement and distribution processes, elimination of cross-functional conflicts).

The frontier areas of integration of marketing and logistics are procurement, a range of products, long-term partnerships with customers in the framework of the implementation of logistics service, and etc. Marketing "links" the sales functions of one enterprise to the purchasing functions of another, and logistics systematizes these links. The field and nature of interaction between marketing and logistics processes at the enterprise is a wide range of activities related to the movement of raw materials from the supplier to the end customer and allowing to provide it with goods in accordance with the current need. Therefore, the marketing logistics system is a self-adapting feedback system that retains functionality in case of unexpected external and internal changes, and performs functions synchronized in time and space in the field of supply, production, sales.

The research of the basis of marketing logistics and the results of the analysis made it possible to distinguish elements of this system, which are indicators of assessing the competitiveness of the enterprise: synchronization in time and space of flows of goods and services; Quality and quantity of goods and services driven by demand; creating competitive prices for goods and services by minimizing costs; Using tools to promote goods and services in accelerating their implementation and organizing streaming processes; identification and realization of the company's potential by carrying out marketing and logistics research.

In order to achieve the necessary effect of the systemic interaction of marketing and logistics as a philosophy and key areas of business, focused on external for the organization and internal transactions, it is necessary to fulfill the supporting and systematic conditions of such interaction: organization of a flexible supply chain controlled by demand; reorientation from profitability indicator to performance indicator, from transactions—to relationships, from goods—to buyers.

5 Conclusion

A long-term corporate roadmap is needed to achieve key goals and indicators that ensure the competitive position of the enterprise. Such a comprehensive action plan will allow businesses to remain stable and strengthen their financial situation. At the same time, there will be an increase in sales, a decrease in production costs, distribution, management, which in turn will increase the efficiency of the business.

The nomenclature of competitive factors of a particular enterprise for practical application includes both general and specific meters (Fathutdinov 2016; Gavrilova et al. 2021), which can only be considered universal with a certain degree of accuracy. In this regard, it is not possible to propose a single algorithm, a ready-made "recipe" of key indicators for management decisions (Mikhailova and Gavrilova 2020).

Unified methodological approaches contribute to their identification and make it possible to quantify and determine their significance for the activities of the enterprise. All this ultimately allows you to build a reasoned competitive strategy and tactics for executing client-oriented business processes. Such measures, which ensure increasing the competitiveness of the enterprise, should primarily be aimed at "checkpoints" in the enterprise's activities, strengthening promising sources of generation of key elements of the current business model and the capabilities of the external environment.

The development of its alternative options, the development of marketing logistics based on the synchronization and integration of marketing and logistics processes, marketing and logistics information under the general managerial leadership is a factor and condition for strengthening the financial independence of the catering enterprise, a reserve for improving its efficiency.

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Domestic Control in Consumer Cooperation as a Means of Ensuring Economic Security

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Abstract Intra-farm or internal control is relevant in any economic system. The advantages of this type of control are obvious: speed, timeliness, high quality (carried out by qualified specialists working in the organization). Optimally organized internal control prevents distortions, errors and abuses in the process of generating performance indicators, therefore, contributes to effective and break-even activities for the long term. The purpose of the article: on the basis of a retrospective study of the activities of the control bodies of the consumer cooperation system, show that domestic control has not lost its relevance at present. The experience gained over a century has not prevented the improvement of internal control forms and methods, but has helped to optimize them. The purpose of the work is achieved by implementing the following tasks:

- study of the chronological sequence of the development of intra-economic control in consumer cooperation organizations;
- substantiation of the importance of internal control for ensuring economic security and their relationship.

Internal control occupies a serious niche in the management system of all parts of the organization, allows you to identify the weaknesses of organizational, management and economic processes, and also guarantees the optimal use of monetary

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and other resources. Therefore, internal control affects the organization of the entire management system.

Keywords Consumer cooperation · Internal control · Control procedures · Certification methods · Audits

JEL Codes L31 · M49 · P13

1 Introduction

A retrospective analysis of the development of internal and internal control and an analysis of its current state shows that the leaders of the consumer cooperation system took appropriate measures to organize an effective control system that allows to fully ensure compliance with the requirements of regulatory legal acts and instructions of the Central Union of Russia in the conduct of financial and economic activities. For many years, the system of internal control has been improved, making it possible to ensure the effective activities of economic entities, and the applied control methods have allowed and make it possible to ensure economic security. High-quality organization of the system of internal control in consumer cooperation organizations contributes to increasing the effectiveness of the application of the departmental management system.

The development of internal control and audit in our country was made by domestic economists Baryshnikov N. P., Belobzhetsky I. A., Bogomolov A. M., Kondrakov N. P., Ovsiychuk M. F., Petrova V. I., Podolsky V. I., Sidelnikova L. B., Sokolova, Suglobov A. E., Sheremet A. D. and others.

2 Materials and Method

The research uses a dialectical method that allows to study the importance of control in the activities of cooperation in constant development and interaction, as well as the methods of systemic comparative and logical analysis, the method of grouping, which allows you to ensure the validity of the results of the research.

Internal control in the modern conditions of organizations and enterprises plays an important role in ensuring break-even and safe business for the long term.

The organization of internal control is regulated by the Federal Law "On Accounting" in the Russian Federation, according to which: "An economic entity is obliged to organize and carry out internal control over the facts of economic life," article 19 p. 1 (2020)

3 Results

A feature of consumer cooperation organizations is their multi-sectoral affiliation, which affects the forms and methods of conducting control measures to identify and prevent possible distortions, errors or violations.

In the system of consumer cooperation, from the moment of its formation to the present, there is internal economic control in the form of the work of audit commissions. The table presents a retrospective analysis of control bodies in consumer cooperation (Table 1).

Therefore, internal control in consumer cooperation has quite long historical roots, which indicates a lot of experience in conducting control procedures.

Domestic control in consumer cooperation organizations developed and improved along with the development and reform of accounting, management and tax accounting. A characteristic feature of internal control is that it represents the integration of all types of control: accounting, management, tax, administrative, etc. Different types of control may have different goals, regulatory regulation, subordination, reporting. Methods of monitoring procedures: observation, tracing, comparison, analysis, inventory, etc. are common for all types of control.

Internal control in consumer cooperation organizations, presented in the form of audit commissions, is considered departmental control and is subsequent in nature. Monitoring functions are provided by internal control, organized in consumer societies. It should be noted that the internal control service may consist of one or more highly qualified personnel; the option of outsourcing is possible and when the functions of internal control are performed by the audit organization under the contract for the provision of services to the accompanying audit.

Current internal controls help to correct or prevent possible distortions, inaccuracies and abuses in a timely manner. The ability to timely prevent negative positions in the registration of business transactions, the calculation of taxes and fees, the formation of a financial result provides economic security to consumer cooperation organizations.

The economic security of the enterprise depends on the influence of external and internal threats. External ones may arise from the economic and political situation in the country, credit and financing conditions, intra-industry linkages, environmental factors, imbalances in the structure of the market for goods and services, etc. Internal threats are completely dependent on the owner (manager), increase in the cost of products, decrease in revenue from sales, organization of logistics, sales policy, reduction in financial results and others.

An optimally organized and well-functioning internal control system reduces external and internal risks, which depend on management's ability to effectively prevent them and address negative impacts. The internal control service provides timely management of information necessary for making economic and managerial decisions, which together will contribute to the elimination of threats.

The objective component of ensuring the economic security of consumer cooperation organizations is the need to concentrate material, labor and financial resources.

Table 1 Development of control in consumer cooperation

Years	Monitoring bodies
1898	The first cooperative union was created—the Moscow Union of Consumer Societies (MUCS)
1917	The Central Union was formed
1917–1923	An instructor's board of the Moscow Council of Consumer Societies was created, under whose leadership control and audit work was carried out
1923–1924	Creation of shop and canteen commissions (this is public control, the purpose of which was to carry out the daily control of each enterprise)
1932	The beginning of the development of departmental control in the USSR, including in consumer cooperation
1936	A resolution of the Central Executive Committee of the CPSU (b) of 15.04 136 was adopted. "On internal financial control and documentary audit of institutions, enterprises, economic organizations and construction," according to which all organizations were obliged to establish control and conduct documentary audits at least once a year of all institutions and enterprises (1936)
1939	The management of the audit commissions of consumer unions, the creation of methodologies for conducting inspections is entrusted to independent audit commissions, transformed from an instructor and audit department on the basis of Decree of the Presidium of the Central Union of the USSR and the RSFSR No. 826 (1939)
1941	Audit departments have been established to control the security of cooperative property at the central accounting offices of the Central Union and consumer unions
1943	The presence of departmental control in the consumer cooperation system made it possible to assign additional control functions for observing the rules of Soviet trade to the central accountants of the Central Union, republican and regional consumer unions
1946	Improvement of horizontal linkages of the internal control service. The Central Union has created an audit department, in the republican and regional consumer unions—audit departments. The post of auditor-instructor was introduced in each district consumer union, which was subordinate to the board of the district consumer union and the audit department of the regional consumer union
1948	Creation of a single organizational and audit department to replace the organizational and audit departments, on the basis of the decision of the Central Union Board
1953	The Board of Consumer Unions creates audit departments instead of organizational and audit departments on the basis of a resolution of the Board of the Central Union
1956	The financial department of the Central Union is created on the basis of the Resolution of the Board of the Central Union, according to which audit departments and departments were separated from organizational structural divisions and included in its composition
1960	Creation of the audit department of the Central Union, in the same year in the same year it was decided to conduct comprehensive audits

(continued)

Table 1 (continued)

Years	Monitoring bodies
1967	In accordance with the centralization of the control and audit apparatus carried out by the Board of the Central Union, the auditors of regional consumer unions were transferred to the states of regional consumer unions or to the newly created zone control and audit departments
1978	In most district consumer societies, independent control and audit departments are created
1983	To improve the quality of audit checks, Decree of the Central Union No. 158 approves instructions on the procedure for conducting comprehensive audits of financial and economic activities in organizations (enterprises) of consumer cooperation (The decision of Union No. 1983)
1988	Accounting, reporting and control departments are established by combining audit and control departments and central accounting departments
1992	In each consumer society or union, audit commissions have become control bodies, which were elected on the basis of the Law "On Consumer Cooperation (Consumer Societies, Their Unions) in the Russian Federation" adopted this year (Law of the Russian Federation 1992)
2001	For implementation of institutional control the Presidium of Council of Central Union of Consumer Cooperatives made the decision on creation in Central Union of Consumer Cooperatives, the republican, regional, regional consumer unions of control and audit administrations
2020	Currently, the functions of monitoring compliance with the Charter of the Central Union, the economic, financial and other activities of the Central Union and the organizations it has created are performed by the Audit Commission, which reports to the General Meeting of Representatives

Source compiled by the authors

Material resources serve the uninterrupted operation of all parts of the production process. Production of goods, works and services depends on the quality of materials, raw materials and their uninterrupted supply. The price range of material resources supplied is important. Suppliers or counterparties must be competitive in the material supply market. The organization has the right to choose a more reliable supplier if there are obvious threats. The most reliable suppliers are those using advanced technologies, financially stable for a number of years, with high liquidity.

Labor resources, especially "fine matter," depend on the professionalism of each worker, his attitude to the performed labor functions, productivity, therefore, the quantity and quality of the goods, work, and service produced. Motivation of their activities, moral and material incentives are important for labor resources.

Financial resources have supported the organization since its inception and throughout its activities. Financial resources are characterized by reproduction, the effective activities of economic actors, leads to the achievement of the goal of profit. A positive financial result indicates a positive difference between the income and expenses of the organization.

Effective resource management ensures the economic security and sustainable functioning of the organization in the present time. It provides an opportunity to create potential for development, as well as growth and break-even activities in the future.

It is important to remember the need for strategic and tactical planning, budgeting, while the directly proportional relationship is obvious: the higher the ambitions (indicators) in planning, the better the performance.

Effective resource management ensures the economic security and sustainable functioning of the organization in the present time, provides an opportunity to create potential for development, as well as growth and break-even activities in the future.

Economic security targets predict the development of the organization through the collection, analysis and evaluation of available performance indicators; prevent wrongful intentions; protect the legitimate rights of workers; it helps to promote the preservation of material assets and develop optimal economic and management solutions.

4 Conclusion

Therefore, the relationship between domestic control and economic security is evident. Organizations with a high-quality system of internal control have a more stable opportunity to protect the business from external and internal threats.

Since each organization has an individual economic security system, and consumer cooperation is a multi-sectoral system, the variety of control procedures used contribute to ensuring systematic work in the field of economic security.

The research conducted on the development of internal control in retrospect in consumer cooperation organizations made it possible to determine the impact of a systematic approach to internal control, which allows ensuring the effective activities of organizations in the present and long-term. Internal control, being a method of ensuring economic security, using available resources (material, labor, administrative, intellectual, etc.) and tools (observation, comparison, analysis, synthnesis, etc.) performs protective functions against risks of various origins.

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Financial Literacy as the Basis of Economic Knowledge of the Younger Generation

Irina V. Neprokina and Elena A. Sidyakina

Abstract This article is devoted to the results of student participation in the National Project "Education," one of the areas of which is "Professional internship 2.0." The purpose of this research is to develop cases that students chose by order of the employer—"Financial literacy at the second level of education (grades 5–9)" and "New methods and techniques for implementing the fundamentals of financial literacy in the school environment through extra-time activities." Financial literacy as a separate subject of research is considered from the point of view of formed knowledge, skills and skills that allow individuals to objectively assess the economic situation with the aim of subsequently forming their own economic behavior. It is shown that participation in the development of national projects allows graduates to find a worthy employer and a promising place of work. Factors have been identified that influence the interest of students in the development and filling of various cases that are interesting to the employer. The material of the research is of practical importance, which is that the conclusions contained in it, recommendations can be used to basic study of financial literacy at the second level of education.

Keywords National project · Functional literacy · Economic knowledge · Financial literacy · Professional internship

JEL Codes P42 · I29 · A22

1 Introduction

When developing a national project in the field of education, the Government of the Russian Federation assumes that in 2024 it is necessary to solve a number of tasks, the main of which will be "the introduction at the levels of basic general and secondary general education of new methods of education and upbringing, educational technologies that ensure that students learn basic skills and skills, increase

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their motivation for learning and involvement in the educational process" (Decree of the President of the Russian Federation 2020).

Ensuring the global competitiveness of Russian education, becoming one of the leading countries in the world in the quality of general education leads to the emergence of new interesting technologies and teaching methods (Miloslav et al. 2016). In 2019, the requirements of federal bodies appeared to introduce a new program "Functional Literacy" into the educational programs of schools. The main thing becomes functional literacy, since this is "the ability of a person to solve standard life problems in various areas of life and activity based on applied knowledge" (Konasova 2012).

We agree with N. Y. Konasova that "the formation of functional literacy can be achieved by: creating conditions for the formation of functional literacy, changing the content of education, changes in teaching technologies (Konasova 2012).

Comparative international studies presented in the international program on assessment of educational achievements of students (PISA-2018) include: reading and mathematical literacy, natural science and financial literacy (Main results of the International PISA-2015 Study 2020).

In scientific research, you can see various concepts of "financial literacy." This is the competence of a person in making competent financial decisions that help to maintain and improve his financial well-being (Franzuzova 2017).

PISA determines "how well students can apply what they have learned; can apply knowledge gained in unfamiliar life situations. This approach reflects the fact that the modern economy rewards people not for what they know, but for what they can do with what they know" (Rudkovskaya 2014).

2 Methodology

Within the framework of the modern development of society there is a development of market relations, which act as the main formation of the economic sphere of the state, which determines the need for the personality to form a certain range of knowledge that reflects the specifics of ideas about the economy and other applied economic disciplines (Strategy for improving financial literacy in the Russian Federation for 2017–2023 2020).

"Economic knowledge is necessary not only for specialists in the field of economics and other applied areas of the specified cycle, but also for those who are not related to this field of professional activity, since in the process of life each person faces certain economic problems that require a practical solution, and the solution should be based on an understanding of the essence of building economic relations from the point of view of achieving a positive result" (Sidyakina 2012).

Financial literacy as a separate subject of research is considered from the point of view of the formed knowledge, skills and skills that allow individuals to objectively assess the economic situation with a view to the subsequent formation of their own economic behavior.

"Financial literacy is a prerequisite for personal socialization. The emergence of this problem is reflected not only in the standards of the third generation, but also in professional standards." (Neprokina and Ershova 2015).

"It is at school age that the foundations of a socially active person are laid, showing interest in society, financial relations, independence, respect for themselves, surrounding comrades, their parents and other valuable qualities. The Financial Literacy Program contributes to building the foundations of financial literacy and developing its own concept of financial stability. The acquired knowledge, personal guidelines and norms of financial behavior will ensure reasonable behavior in the economic environment." (Sidyakina 2012).

Psychologists and teachers did not come to a consensus on the standards of training in the field of financial literacy. Most of them believe that it is better to start financial literacy training in the middle school level (Smirnova 2016).

The development of this problem is carried out not only by methodologists and teachers in our country, but also abroad. A large material on the formation of financial literacy can be found in the publications of the American entrepreneur, investor, writer and motivator R. Kiyosaki. "In all his books, Kiyosaki insists—a person must master financial literacy" (Natasha 2020).

The authors also used the materials from National Education Project (2020) in this study.

The main goal of the article is to find the optimal option of including elements of financial literacy in the existing educational program in schools from grades 5 to 9.

3 Results

The National Education Project is an initiative aimed at achieving key objectives.

The new student-potential employer interaction platform provides the opportunity to implement the following areas of work:

- development of the student-potential employer interaction system;
- involving educational organizations in cooperation;
- involving the largest Russian companies;
- development of a mentoring system in enterprises;
- promotion of the early career guidance system (Rudkovskaya 2014).

Our research has shown that the formation of financial literacy in school is carried out mainly in additional lessons, which are not always supported by high-quality and diverse methodological support. Therefore, as part of master's theses, students developed the problem of forming the foundations of financial literacy among students in 5th grades.

The process of working with students included an orientation towards the following areas of improving financial literacy:

- Creating an understanding of basic economic concepts.

- Learning about financial products and services.
- Development of creative capacities aimed at solving financial problems using creativity and the ability to protect their economic rights and freedoms.

While the problem of improving financial literacy has not been particularly relevant in the past, the need to develop a proper level of theoretical knowledge and practical skills in this area of work is now reflected, with particular attention being paid to how to properly meet financial needs, allocate the budget, make choices in the system of financial services and products, etc. (Brekhova and Almosov 2015).

In the process of developing the content of the school curriculum, the levels of financial literacy were presented: high, medium and low.

High level: students with this level of financial literacy can freely explain the meaning of basic basic economic concepts, while having a steady interest in further replenishing theoretical knowledge. In the process of practical activity, schoolchildren operate with economic concepts, act from the position of active subjects in building economic relations, and are also ready to interact with teachers and peers in the framework of considering problems of a financial nature and finding ways to solve them.

The average level of financial literacy indicates that children have an idea of economic concepts, but they cannot always explain them and use them in practical activities. Students have an unsustainable interest in further improving the level of financial literacy, while perceptions and problems of a financial nature and possible ways to solve them are unstable and superficial, which indicates the unwillingness of students to act as active subjects of financial relations, which reflects the inability of children to fulfill certain tasks and solve practical problems of a financial nature (Strategy for improving financial literacy in the Russian Federation for 2017–2023 2020).

Being at a low level of financial literacy, students have no idea of economic concepts, do not use economic words in speech; they are irresponsible, initiative-free, not persevering in achieving the goal.

Three components of financial literacy were also identified:

- understanding of financial categories, financial products, financial environment;
- emotional and positive attitude towards financial activity;
- ownership of ways of solving modelled life situations of a financial nature.

The understanding of financial categories included: money, budget, income—expenditure, savings, bonus, inflation, purchase—sale, risks; to financial products: cards, checks, wages, bank account, insurance, pension, scholarship; to the financial environment: price, benefit, advertising.

Each component of financial literacy includes components and indicators.

Components and indicators of the first component of financial literacy:

- the ability to understand financial categories in modeled life situations. Indicators: ideas about the purpose and types of modern money; that money can be earned, saved, spent; that money may devalue; views on the types of trade (sale and purchase, barter); ideas about the budget, how to plan and allocate the budget,

how to save the budget; perceptions of the types of financial risks and how to mitigate them;

- the ability to understand financial products in modeled life situations. Indicators: perceptions of the types and purpose of social benefits (pension, scholarship); ideas about the types of bank cards (credit, salary, electronic wallet) and their transactions; representations of financial transactions (related to bank accounts, cards, etc.) and related concepts (credit, shares, transfers, interest, deposits, investments); ideas about the purpose and types of insurance; Understanding what wages are (pay for quantity and quality of work); ideas about banking professions, about professions related to finance;
- the ability to understand the financial environment in modeled life situations. Indicators: ideas about what the price is, how the price of the goods is formed, that the price can be different for the same goods; ideas on how to obtain financial benefits (interest, bonuses), on how to save money (study, compare and analyze prices); Understanding the purpose and types of advertising; ideas about professions related to advertising activities.

Components and indicators of the second component of financial literacy:

- ability to show interest in financial activities. Indicators: interest in modern professions related to financial activities (cashier, accountant, manager, economist, insurance agent, credit expert, advertising specialist, financier, auditor, marketer, etc.); interest in various trade and financial transactions; interest in advertising activities; interest in financial concepts (including various types of money, etc.); interest in financial products; interest in mathematical operations with money, in solving problems of a financial nature.
- ability to be willing to participate in financial activities. Indicators: the desire to display in the game, in modeled life situations, the activities of people in financial professions; the desire to carry out various trade and financial transactions in modelled life situations; seeking creative behavior in advertising situations; the desire to actively use financial concepts in speech: in game situations, modeled life situations, in real life situations related to financial activities; the desire to operate financial products in modeled life situations; desire to carry out mathematical operations with money, solve problems of a financial nature

Components and indicators of the third component of financial literacy:

- ability to operate financial products in modeled life situations. Indicators: ability to use financial concepts in speech: in game situations, modeled life situations, in real life situations related to financial activities; ability to perform various trading operations in game and simulated life situations (purchase, sale, barter); ability to plan and allocate a budget, to spend it economically in game and simulated life situations; ability to calculate basic financial risks, competently use methods of their reduction in game and simulated life situations; ability to carry out mathematical operations with money, solve problems of a financial nature;

- ability to manage the financial environment in modelled life situations. Indicators: ability to display various financial transactions in game and simulated life situations (money transfers, opening deposits, making transactions with bank cards for the benefit of themselves, buying shares, making a loan); ability to display in the game, in modeled life situations, the activities of people in financial professions.

The tasks are based on the situation of social life. The task system provides an opportunity to understand "what is included in the structure and content of financial literacy. The system of developed tasks reflects topics and contexts relevant for students of a certain age, which determines personal interest in their implementation" (Strategy for improving financial literacy in the Russian Federation for 2017–2023 2020).

In order to test the developed material, students of Togliatti State University became participants in the project "Professional Intership 2.0." The project started in June 2019 and is a new scheme for interaction between a student of an educational organization and an employer.

In the first wave of the competition of student works of the project "Professional Intership 2.0" took part "80 thousand students, more than 1100 leading employers and 1700 educational organizations from all regions of the country" (Project: Training 2.0 Official site 2020).

The case "Financial literacy at the second level of education (grades 5–9)" was chosen. The proposed content of the case is the basis for studying financial literacy at the second level of education. The material developed included an analysis of teaching aids presented on the educational market, versions of curricula designed to study financial literacy at the second level of education (5–9 classes).

Students took part in the second stage of the project Professional Intership 2.0." The competitive work of master's students was the creation of a teaching and methodological complex for the formation of financial literacy of schoolchildren, which includes a thematic plan for students in the 5th grade, the development of methods for teaching financial literacy, tasks and tasks that allow forming financial literacy at the first stage of study.

The case developers became the winners of the first and second stages of the project "Professional Construction 2.0," which was confirmed by the diplomas of the project winners. This case was published by representatives of one of the secondary schools in Kiselevsk (Kemerovo region). Girls got a chance to rise to professional peaks—to undergo an internship or even to find employment in a partner company of a federal project. Scientific Director I. V. Pokolkin received gratitude from the project team "Professional Intership 2.0" for her active participation in the project and mentoring the participants of the I and II waves of the All-Russian Student Work Competition and contribution to the development of a practical-oriented approach to education.

4 Conclusion

Among the metaphysical universal educational actions that concern the financial literacy of students, the following should be noted:

- to develop the ability to solve practical financial problems;
- to correctly set financial goals and achieve a positive result;
- to assess the possibility of using alternative directions in solving financial problems;
- to skillfully act as various subjects of economic relations;
- to implement not only the possibility to obtain theoretical material, but also the ability to apply it in practice (Sidyakina 2017).

Financial literacy as a separate subject of research is considered from the point of view of formed knowledge, skills and skills that allow individuals to objectively assess the economic situation with the aim of subsequently forming their own economic behavior. In the context of financial literacy, people learn to work with budgeting, which is relevant for stabilizing the economic culture of the individual.

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Current State of Child Abuse: International Level

Tatyana V. Pinkevich, Liudmila A. Bukalerova, and Anna E. Dolzhikova

Abstract In this study, we analyze the current state of child abuse and the role of international organizations in countering this crime. The paper presents a classification of child abuse, paying special attention to digital child abuse (via the Internet and messenger apps). The use of system-structural analysis allowed us to identify the current threats that this crime poses as well as the methods of its prevention. Using general and special scientific methods, we concluded that child abuse is an international crime, facilitated by the use of digital technologies. In this case, only international cooperation can help effectively counteract digital child abuse.

Keywords Sexual child abuse · Digital technologies · International cooperation · Counteraction

JEL Codes K32 · K36 · J12 · I38

1 Introduction

Informational networks, such as the Internet, permeate all areas of societal life, positively impacting the development of the global community. However, their active use (especially by younger people) is a cause for concern since the amount of disturbing and disrupting content on the Internet is extremely high. This is evidenced by the high criminalization of young people and their receptiveness to negative actions (Polonsky 2017).

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Child abuse is an especially serious problem that plagued humanity during all its existence. International lawmakers adopted several documents that define the main directions of counteracting child abuse (Hague Conference on Private International Law 1980, 1996; Keller and Dance 2019; Ovchinsky and Zhdanov 2020; Polonsky 2017; Federation 2013).

There are several types of child abuse: physical abuse, neglect, psychological abuse (emotionally inappropriate treatment), and sexual abuse. However, we note that these types can combine (e.g., breaking the sexual abuse victim's resistance via physical and emotional abuse). All types of child abuse are extremely dangerous and morally abhorrent, but sexual abuse deserves special attention.

In this study, we aim to examine the current state of child abuse (especially digital ones) and the international legal countermeasures to this crime.

The main tasks of the study are:

- To analyze the current state of digital child abuse;
- To define the sub-types of digital child abuse;
- To study the measures that protect children from abuse.

2 Materials and Methods

In this study, we employed the methods of:

- System-structural analysis (to identify the danger that child abuse carries and the prospective ways of optimizing preventive measures against child abuse);
- General scientific methods (statistical, system-prognostic, etc.).

3 Results

According to the results of our study, child abuse is appallingly common due to the fact that children often cannot tell their relatives or loved ones about the sexual abuse. Moreover, this crime is usually repeated and continuous because the perpetrator can use intimidation, threats, or blackmail. These facts decrease the chance of uncovering a large portion of these crimes. In many cases, the perpetrator is the victim's relative or a friend – the victim is often afraid to speak up, unwilling to disrupt the familial or friendly ties that other people have with the perpetrator.

Official statistics demonstrate that around 15% of children fall victim to sexual abuse or molestation (Zdorovye Lyudi n.d.). Experts say that digital technologies often facilitate such crimes since social networks and messengers allow to easily disseminate all kinds of unsavory content. Evidently, the number of victims of sexual child abuse will continue to rise.

Special attention to the problem of sexual child abuse is paid at both the international and regional levels. However, the COVID-19 pandemic forced lawmakers and authorities to shift their focus. In July 2020, the UN published their "Global Status

Report on Preventing Violence against Children 2020" report (UNESCO 2020). The report has shown that the number of child abuse crimes rises annually. On average, more than 40,000 children fall victim to homicide annually. According to the report, around one billion children are subjected to abuse (every second child); more than 300 million children fall victim to physical and emotional abuse; every fourth child (under the age of five) living with an unmarried mother is abused by their mother's partner. Young children and teenagers are most commonly abused both at home and in school. One in three children aged 13–15 years were in a physical fight at least once (a quarter of those are girls). Around 30% of children aged 11–15 were at least once bullied by their school peers. According to the report, more than 120 million girls and young women were subject to sexual abuse or molestation. A sociological survey demonstrated that 46% of respondents see nothing wrong with child abuse. However, child abuse causes severe problems for victims further in life. For example, adults who experienced physical, psychological, or sexual abuse in childhood are 7 times more likely to be involved in interpersonal violence (as perpetrators or victims) and 30 times more likely to commit suicide. Moreover, victims of child abuse are 14 times more likely to perpetrate violence against children and adults and 16 times more likely to fall victim to further abuse.

- Despite the evidence in the report, the UN experts believe that the proposed complex of measures can achieve 20–50% reduction in child abuse. The measures include (WHO 2020):
- Promoting good governance and coordination of countermeasures for child abuse;
- Prioritizing data collection;
- National action plans for preventing and counteracting child abuse;
- Ensuring adequate funding for action plans;
- Strengthening legislative frameworks;
- Using scientific evidence in countermeasures.

Of course, some of these measures can reduce the number of child abuse crimes. However, most of the measures cannot be applied in all countries without accounting for their socio-economic and socio-political status. For example, 80% of countries have national programs for counteracting child abuse, but only 20% of them are well-funded.

In mid-2020, the Council of Europe adopted Resolution *2330 (2020) "Addressing Sexual Violence against Children: Stepping up Action and Co-Operation in Europe"* (Federation Council of the Russian Federation n.d.). *The European community is seriously concerned about the prevalence of sexual child abuse and the fact that younger children more frequently fall victim to such crimes. It is estimated that one in five children are subject to sexual abuse in Europe.*

In the conditions of the current pandemic, the threat of sexual child abuse rose significantly. Children living below the poverty line increasingly fall victim to sexual exploitation. As the time that children spend in online games, social networks, and educational websites increases, so does the number of threats. Sexual abuse can take many forms—from harassment to molestation and gang rape. Sexual abuse is a broad phenomenon that requires complex, targeted measures on all levels of legislation.

The Parliamentary Assembly of the Council of Europe views sexual child abuse as a political priority and calls upon the member states to use all available resources in counteracting this crime.

Moreover, the Assembly proposed several countermeasures. Most of them are too general, but some deserve special attention:

- Developing and improving the existing laws to protect children against sexual violence;
- Abolishing the statute of limitations for sexual violence against children or ensuring that the prescription periods for sexual violence against children are at least 30 years after the victim has reached the age of 18;
- Adequate compensation for victims of child abuse that consummates the harm suffered, including by the setting up of national funds for victims.

On July 24, 2020, the European Council in Brussels adopted the "EU Strategy for a More Effective Fight against Child Sexual Abuse" that is to be implemented until 2025. The Strategy proposes creating a European center to prevent and counter child sexual abuse that would store information on relevant crimes from both law enforcement authorities and non-profit organizations that help victims of child abuse.

The Strategy presupposes expanding not only the information capabilities of law enforcement in EU member states but also obliging Internet providers to disclose information on the persons who disseminate illegal content.

The European Union Agency for Law Enforcement Cooperation (Europol) activities in fighting child abuse deserve special attention. Its report "Exploiting Isolation: Offenders and Victims of Online Child Sexual Abuse during the Covid-19 Pandemic" (Ovchinsky and Zhdanov 2020) states that the number of perpetrators that distribute child pornography on the Internet has increased significantly. The reason for this may be the increased demand for such content during isolation. The first half of 2020 has seen the highest number of calls to child abuse hotlines in four years.

Additionally, Europol controls the activity of darknet websites. The demand and supply for child pornography on darknet websites fluctuate greatly, according to their popularity, availability, and other factors. For example, the period of March–May 2020 saw increased activity on the video sites of the darknet that publish video materials named "hidden camera," "web camera," or "livestream." The number of messages on darknet forums increased threefold.

The materials that the children themselves allegedly made deserve special attention. Europol and other law enforcement organizations are concerned by the increased number of such content on the Internet.

Some perpetrators are interested in child pornography with infants or children that cannot speak yet. Materials with scenes of humiliation, torture, or violence are especially in-demand. Most of these materials are currently encoded or available only via anonymizing application, namely the Tor VPN network.

The Europol report also draws attention to Clearnet—websites and social networks used to disseminate unsavory content. During the COVID-19 pandemic, the European countries saw a two fold increase in the numbers of primary or repeated distribution of child pornography. Such materials are made in a variety of ways, the

most dangerous of which is the direct contact of the abuser and the child with the use of trickery or blackmail.

The amount of sexually explicit materials made by children themselves is a cause for concern, especially since the average age of children in these materials decreases. One reason for this is the restriction of physical contact with peers. The number of minors sexually harassed or blackmailed by Internet criminals also increased accordingly. The USA also faces serious child abuse issues. New York Times published the results of research into the rising sexual abuse cases. According to the research, the number of sexual abuse cases has risen by a factor of 45 in the past 10 years and shows no signs of stopping (Keller and Dance 2019).

To make things worse, there was a relatively recent Italian-Russian child abuse scandal (Bensi 2000). This case was brought to light thanks to the child abuse hotline made by the Italian priest seeking to expose pedophile websites.

Italian police uncovered a Russian-made child pornography website made for Italian clients. Moreover, the clients demanded more "sensational" material, including snuff tapes with children.

The investigation lasted a year and a half. The joint Italian-Russian operation resulted in 10 arrests, 7 of which were Russian citizens. During the investigation, the authorities concluded that the snuff material was not made in Russia. The criminal organization had branches even in Great Britain.

The analysis of banking operations has shown that the child pornography business brought the perpetrators over 600 mln. USD. The real scale of this market in Italy is about 5000 people, most of whom are under investigation.

4 Conclusion

This joint operation demonstrates that child abuse is an international crime, usually perpetrated by a group of people with good skills in information technologies, video making, and editing. Moreover, some of them are highly-organized and can easily change their field of activity or use the gained knowledge to increase turnover and evade law enforcement.

Moreover, international cooperation is certainly beneficial to the investigation, prevention, and prosecution of such crimes. These facts can decrease the number of materials that contain scenes of sexual child abuse.

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Gaming Technology as a Means of Correcting Features in Children 5–7 Years Old with Autism

Olga V. Dybina

Abstract This article is devoted to game technology in correctional work with preschool children with autism. Theoretical studies have been analyzed, according to which psychophysiological features of children with autism spectrum disorders are revealed. A review of domestic literature devoted to the study of this problem is being carried out. The scope of scientific fields is described, in the context of which the problem of the development of children with autism is studied. The article focuses on the use of game technology to correct children with this pathology. The work presents the author's definition of the concept of "game technologies". It is noted that gaming technologies are represented by didactic games developed taking into account the age and individual characteristics of older preschoolers with autism spectrum disorders. The article reveals the specifics of the process of using game technology: from the selection of didactic games of their modification to the transfer of the obtained skills from didactic games to subject (didactic) material. The leadership of didactic games is of interest, their practical significance is undeniable, they allow children to master the properties and characteristics of objects without coercion and in an accessible form. Psychologists and defectologists can use diagnostic games in practical activities in preschool educational organizations.

Keywords Children with autism spectrum disorders · Features of children with autism · Game technology · Didactic game · Types of games

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1 Introduction

This article examines the psychophysiological features of children with autism spectrum disorder (hereinafter—ASD), as well as the means that affect the correction of this pathology. The problem is modern and relevant. First, the relevance is that since

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the introduction of the term "Autism Spectrum Disorders" by Lorna Wing in 1988, the number of children falling into this group of disorders in the United States is estimated at 16, 8:1000 (according to CDC—Centers of Disease Control and Prevention for 2014), official statistics do not exist in Russia at the moment due to the practical lack of early full-fledged diagnosis and delineation of ASD-like conditions.

Secondly, the criteria for diagnosing ASD are: social exclusion and stereotyping of behavior. In addition, criteria such as: stereotypical and limited behaviors, activities and interests, violations of the imagination are distinguished. The peculiarities of thinking of children with ASD are not prescribed as the main criterion for diagnosis, but, nevertheless, have a specific development character and determine many mental processes, activities and ontogenesis of the child with ASD. This justifies the second part of relevance.

2 Methodology

This research is based on:

- Works of domestic and foreign authors studying children with autism spectrum disorders, their peculiarities affecting familiarization with the environment (Appe 2016; Baenskaya 2013; Nikolskaya 2014; Autism 2005; Baron-Coen and Wheelwright 1999; Mecca et al. 2014).
- Results of studies showing the effectiveness of various technologies as a means of forming and developing different skills in preschool age (Plaksunova 2011; Ern 2014; Hughes 2009; Matson and Sturmey 2011).

Research analysis indicates that the potential of such a tool as game technology is not sufficiently studied; there is a lack of development of corrective-developmental interventions using this technology for children with ASD.

Before considering gaming technology in working with children with autism, you need to know the features of the mental, physical and emotional-will development of children 5–7 years old with autism spectrum disorders. Knowing the features of children with autism, you can competently choose the type of game technology and determine the peculiarity of its use in corrective work with preschoolers with this pathology.

The term "autism spectrum disorders" was first used in the works of Lorna Wing in 1988. Over more than 30 years of the term's existence, the spectrum has changed depending on the directions and results of research on autism. At the moment, the latest international classification—MKB-11—includes three groups of disorders: classical Kanner autism (early childhood autism—ECA), Asperger syndrome (AS) and disintegrating childhood disorders (including atypical autism) (Baron-Coen and Wheelwright 1999).

In 2013, Germany developed a concept for working with people with ASD, which highlighted the following spectrum disorders:

- early childhood autism (is a classic form of childhood autism also called children's autism or Kanner autism, manifestation up to 3 years);
- highly functional autism (autistic symptoms do not affect the intellectual capabilities of the child);
- Asperger syndrome (have linguistic and socially pronounced symptoms, usually such children are able to independently cope with everyday life);
- a typical autism (the presence of not all autistic symptoms or their non-severity);
- Late autism (if autism symptoms appear only after two and a half years, then this disorder is called late autism, if affected children have a particularly serious disease and lose its already existing abilities, today they talk about disintegrating childhood disorder, the terms Heller syndrome, Heller dementia or disintegrating psychosis have been used in the past) (Williams 2006).

In addition to the standard "Wing triad," preschoolers with autism spectrum disorder (hereinafter referred to as ASD) have specific features of mental, physical and personal development. Some authors point out that symptoms and features depend not only on the specific autism spectrum, but also on the age and preservation of cognitive functions (Autism 2005). I. Nolan proposes to divide the characteristics of children with ASD into the following groups: behavior, cognitive processes and training, social skills, speech and communication, sensory and motor systems (Nolan 2004).

K. I. Robertson and S. Baron-Cohen in their work indicate that the features of perception and processing of sensory information in ASD have not previously been distinguished as a separate diagnostic criterion. In recent years, the situation has changed—now the presence of symptoms of impaired perception are considered as precursors to possible violations of social perception and as one of the criteria for early diagnosis. Children with ASD are characterized by a predominance of fragmentary perception, they literally "see leaves on the tree, but do not see the tree itself" (Robertson 2017). This is the basis for understanding autistic sensory experience, and it also emphasizes that perceptual treatment cannot simply be characterized as a feature or disorder, or as a characteristic of hypersensitivity or under sensitivity. Most likely, perceptual representation in ASD shows a relative bias towards local rather than global features of the sensory system, which may be more or less advantageous depending on the requirements of the task. Also, children with ASD are characterized by difficulties in perceiving visual changing objects; temporary features of sensor information processing; difficulties in distinguishing between hearing two close tones and delayed neural responses to them. The latter especially affects the perception of speech sounds—in children with ASD it is difficult, which once again emphasizes the importance of non-verbal development of thinking (Robertson 2017). Fragmentary perception also affects non-verbal thinking—images are perceived by the child not holistically, such thought processes as analysis and synthesis are disrupted or inhibited, so it is very important to use clear images in corrective and developmental work without unnecessary details.

T. Etwood notes such sensory perception features in children with ASD as the presence of sensory overload (especially in children with Asperger syndrome), which

N. Jackson described as "dynamic sensory exposure." Sensory overload occurs due to the large number of sensory stimuli and their saturation (fluorescent lamps, the presence of many bright colors or objects, loud sounds, etc.) (Attwood 2007). I. Nolan speaks about the complexities of modulation of sensory information by children with ASD, they cannot process incoming sensory information as children with normal development, so in children with ASD hypersensitivity (hypersensitivity, oversensitivity) and under sensitivity Hypersensitivity is characterized by increased sensitivity to stimuli and the presence of sensory overload. Under sensitivity manifests itself in stereotypical actions, auto-aggression or stimming (aggression directed by a child at himself is often expressed in causing physical harm to himself), hyperactivity—all this they need in order to feel themselves in space (Nolan 2004). Also, when the processing of sensory information is disturbed, the situation can be aggravated by the increased anxiety of the child (Nolan 2004). In sensory overload, children with ASD may experience aggressive behavior, screams, or self-care down to extreme forms (psychoses). In this regard, children with these features require special conditions—opportunities for safe sensory stimulation.

Back in 1943, Leo Kanner wrote about the magnificent memory of children with autism. Despite the fact that memory in children with ASD has been studied for decades, there are two points of view—the first is that memory is one of the main disorders in autism, and the second is that memory is a secondary disorder. For autistic children, the complexity of the material is important, which varied depending on the age of the child—in young children there were practically no errors in remembering the numbers, it was more difficult to remember the sentence, and the most difficult task was to remember the story. It was found that in some tasks, visual memory in children with ASD acted as a strength, but depended on the complexity of the stimulus material. It is more difficult to give children memory on the faces and, accordingly, facial gnosis (Williams 2006). Thus, the choice of stimulus material should be based on the strengths of the child with ASD—simple and understandable forms and colors previously familiar to the child.

One of the latest studies of imagination in children with ASD, carried out by J. Lowe, children with ASD and children with typical normal development, three attempts were made to draw a "Non-existent animal"—59% of children managed the task for the first time, with the second—68%, with the third—73%. In addition, low rates of generativity (creativity, productivity) were identified compared to normally developing children and lower levels of visual-spatial planning (Low 2009). F. Appe points to violations of the symbolic game in children with ASD—it is replaced by a stereotypical game with objects (Appe 2016). Accordingly, this should be reflected in the shaping experiment: the stimulus material should contain truly existing images and ideas familiar to children.

Sh. Tai et al. (2013) revealed that children with ASD have impaired control of regulation and response formation (Tye 2013). I. Nolan points to increased distraction in children with autism, which can be caused by increased anxiety, lack of sleep and other psychological and biological factors (Nolan 2004). Therefore, it is necessary to correctly choose not only the stimulus material for corrective and developmental

work, but also the time of conduct, the condition of the child, as well as ensure interest in working with a defective teacher.

As noted in their studies by E. R. Baenskaya and O. S. Nikolskaya, speech disorders in children with ASD arise due to communication insufficiency (Baenskaya 2013; Nikolskaya 2014). F. Appe speaks of variable speech defects in children with autism—from non-verbal children to fluent speakers (in Asperger syndrome) who have difficulty using pragmatic speech (understanding and using communication constructs according to the communication situation is difficult). Speech features of children with ASD are also noted, such as: delay or suspension of speech development after a period of normal speech development, the use of stereotypical speech constructions, echolalia, disorders of the prosodic side of speech, violations of non-verbal communication (facial expressions, gestures), the practical preservation of phonetics and grammar in violation of pragmatic speech (Appe 2016). Since the use of speech is the most difficult aspect for children with ASD, and non-verbal thinking stimulates verbal (speech) thinking, it is especially important to observe clear parameters to provide the child with instructions (calm tone, understandable simple grammatical constructions).

Motor and notional spheres of children with ASD have the following features: disorders of small and large motor skills, disorders in the main movements, sluggishness of movements or, conversely, tension, stiffness and mechanicity, lack of plasticity (Plaksunova 2011). The disparity of the expression of stereotypical movements in children with autism is known—they vary in body parts and the frequency of their repetition, as well as in time and location. Thus, it is important to know in advance all the characteristics of stereotypical movements that the child uses, as well as the reason for their use (for example, anxiety) in order to prevent it or create safe and comfortable conditions for the child.

The features of fears in children with ASD were studied by such domestic scientists as E. R. Baenskaya, I. E. Guseva. They noticed that in children with ASD, fears are quite specific and have features that are not observed in children with normal development. In corrective and developmental work with children with ASD, it is important to know their fears so as not to provoke them during work (for example, if a child is afraid of buttons—not to use images of buttons, etc.).

Children with Asperger syndrome are characterized by such a feature as supervaluable or special interests, characterized by an increased interest in certain subjects, fields of knowledge, are most often manifested in interest in various mechanisms (Baron-Coen and Wheelwright 1999). Taking into account the special interests of the child helps to increase motivation for various types of activities.

In order to encode atypical autism in American classifications (DSM-IV, V), the psychiatric term pervasive nonspecific developmental disorders (PDD-NOS) is used, and the term "disintegrative childhood disorders" is used in MKB-11. Study by D.R. Walker et al. (Walker 2004) conducted with groups of children with pervasive-specific disorders, autism and Asperger's syndrome, revealed a number of features. Children with pervasive disorders showed a lower severity of autistic symptoms, compared to the other two groups. As a result, according to the results of the study, children with pervasive disorders were divided into three groups:

- the group with high functionality (24%), resembling Asperger syndrome, had temporary speech delay or moderate cognitive impairment;
- a group with the functionality of childhood autism (24%), had late manifestation or serious cognitive impairment, or too young children who cannot observe certain criteria for autism due to age restrictions;
- a group (52%) characterized by a reduced number of stereotypical actions and repetitive behaviors compared to children with Asperger syndrome and autism (Tye 2013).

As it can be seen from the above data, children with atypical autism are very similar to children with childhood autism and Asperger syndrome, but have a number of other features that allow them to be separated into a separate group. Taking into account the characteristics of each group of disorders is important for determining the capabilities of the child, the goals and tasks of corrective and developmental work.

Various means are known (games, visual activities, art objects and others) that ensure the success of corrective development work. In the present study, it is necessary to consider the possibilities of gaming technologies, their role in corrective development work with children 5–7 years old with autism spectrum disorders.

The purpose of this article is to define game technology as a means of correcting children with autism taking into account their psychophysiological characteristics.

Description. The study is organized on the basis of compensating groups for children with early childhood autism in Togliatti preschool educational organizations. The experiment involved 20 children of 5–7 years old with autism and defectology teachers in the amount of 5 people.

The study used game technology as a set of actions that allow preschool children with autism to be included in playing activities.

The development of game technology in this study depended on the characteristics of children 5–7 years old with autism (violation of the perception of objects, their properties and signs; Low levels of creativity; increased anxiety and others). A special place in game technology is given to didactic games.

When developing didactic games, it is important to us to understand that evident representations prevail over propositional as evident representations are remembered much more accurately and quicker, than their verbal analogs. It follows from this that nonverbal information is acquired by children with autism much quicker and more qualitatively.

Besides, paid attention to fragmentation of perception of a surrounding picture of the world in children with RAS that affects further such thought processes as the analysis and synthesis.

Children with ASD show higher level of effectiveness in visual and spatial abilities tests, and lower in tests of assessment of abstract thinking and formation of conceptual representation (i.e. mobile intelligence—a possibility of use of earlier known knowledge in the new environment). I. Nolan provides similar data that children with ASD have difficulties in creation of the bigger picture which consist in transferring of earlier gained knowledge to new circumstances. Moreover, he notes

that in children with ASD—they don't change the representation at an angle to new information. Because of these shortcomings of development in children with ASD the lag in game activity and violations of imagination is observed.

Children of preschool age have much lower indicator in concrete and abstract reasonings, in comparison with the average population. Besides in children with RAS there are difficulties in the tasks demanding planning, flexibility and braking. "Children with autism can use objects as tools and separately, and in a combination" (Nikolskaya 2014).

All the above-mentioned features of children with ASD can and should be used as a basis for constructing a corrective-developmental process in which stronger points—synthesis and visual-spatial abilities—will support.

We proposed the following didactic games "Color Puzzles," "Shading Figures," "Connect Blocks," "Wisconsin Card Sorting Test," "Rotation of Figures" and others. For example, the game "Color Puzzles." The child is offered a playing field and four "cubes," the experimenter puts the first and second cubes (in combination of color and pattern) on the playing field and gives the child the instruction "Put another" and so up to 4 set "cubes." Depending on the initial level of formation of non-verbal analysis and synthesis of the whole and its parts, the child is invited to go from 2 to 10 levels (at each level there is a larger quantity of "cubes").

Of interest was the didactic game "Painting Figures." First (1–2 occupation) one simple geometric figure and the instruction "Close with red/blue" are given, then the task is complicated (3–12 occupation)—different colors are added, two (3–7 occupation) are offered, then three figures (circle, square, triangle) (8–12 occupation).

Of particular importance is the management of the behavior of children with autism through the rules of the game. An important role was given to observing clear parameters to provide the child with instructions on the game and a positive pedagogical assessment. It allowed to cheer up children with this pathology, to relieve their anxiety and fear.

"A special role was given to games that stimulate creativity, since children have very low rates of creativity. Children, together with a defectologist teacher, modified familiar games (invent new game actions). The relationship between the defectologist and the child is of great importance here. It is important to see individuality in each preschool, to identify its strengths and build on them in solving problems, to help individual children feel confident in themselves, to use a anticipatory positive assessment" (Dybina 2006, 2008).

3 Results

The obvious result was the positive dynamics of familiarization of preschoolers with autism with the subject world using didactic games. Children improved results and almost all criteria rose to one level, they also almost completely formed non-verbal analysis and synthesis, generalization, comparison. Children could non-verbally compare objects, group them into groups according to common signs, build a logical

sequence of actions in a series of pictures, highlight the features of objects as a whole and combine them, find some pictures by analogy.

By the end of the experiment, many children with this pathology changed the level of mastery of the subject world upward compared to the children of control groups, which indicates the effectiveness of using game technology.

4 Conclusion

The implementation of didactic games for children with autism spectrum disorders provides the beginning of increasing interest in the subject world, playing activities in these children. This is supported by studies noting that for autistic children the complexity of the material is important. Using the introduction of children with autism spectrum disorders to the subject world in the work of a teacher makes it possible to strengthen the process of development of different areas of the child's personality, change his position in relation to the surrounding reality and understand its diversity and multifunctionality.

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Attitudes of Teachers to Existing Job Incentive Scheme (Case Study in Tolyatti)

Irina V. Tsvetkova

Abstract The relevance of the article is conditioned by the need of solving the problems stimulating the work of school teachers. Although the incentive system has been introduced in Russian schools since 2008, it is under discussion in scientific publications nowadays. The article presents an analysis of Russian and foreign publications on incentive of teachers' work. The purpose of the article is to study the attitudes of teachers towards the system of stimulating their work, based on the analysis of the results of a sociological survey carried out in Tolyatti. Methodology: The methodological basis of the article is a principal–agent problem. It provides an opportunity to analyse remuneration of teachers from the point of view of administrative functions. School administration acts as principal, establishing a system of incentive payments. They are designed to reward employees for effective and quality work in accordance with priority objectives and evaluation criteria. Results of the research: Empirical basis of the article is presented by the results of the sociological studies conducted in Tolyatti in 2010, 2012 and 2018 on teachers' evaluation of incentive payments. The results of the survey show that the incentive system has a different impact on teachers. There are more respondents in school administrations than in other categories who are satisfied with the incentive system. The teachers' satisfaction with this system is considerably lower. Mainly it's related to the size of their workload, the availability of class supervision, and nature of teaching subjects. Monitoring results show that incentive effect of the existing incentive system is decreasing for the reason that criteria are losing their effectiveness.

Keywords School teachers · Job incentives · Job motivation · Wages · Working conditions · Qualifications · Quality of work · Job evaluation criteria

JEL Codes A14 · J31 · O15

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1 Introduction

Incentives for teachers are subject of much academic and political debates. Incentivising of teachers' work affects quality of work, social characteristics and behavior of teachers, and intelligent growth and education of younger generations. Various types of incentives are used in modern managing practice. Individual incentives reward particular teachers with bonuses for their professional performance. Group incentives orient teaching staff towards the achievement of goals related to collective performance. Competitive incentives involve teachers or schools into competition for some prize. A classification of incentives for work is presented in the work of Nurtaeva (2016).

In education management practices of non-monetary remuneration or sanctions are used. These include education and profession training opportunities, decision-making authority or others, as Gyoreva (2019) points out. Today, a question is still open about development of an effective system of incentives for teachers, stated by Duflo et al. (2012). Various aspects of their work and promoting the quality of their pupils' intellectual growth and education must be taken into account.

2 Literature Review and Methodology

The principal-agent problem is widely applied in modern management practice. This economic theory is based on provision that principals—employers design incentives to force employee agents to act in accordance with the stated objectives, noted in Kitiea and Barkinkhoeva article (2020). As agents, teachers can be seen as employees fulfilling goals of several principals. These include: the state, school administration, parents, employers, etc. The principal-agent problem is based on the assumption that interests of principals and agents do not often coincide. If employers aspire to raise productivity and efficiency, employees want to be highly compensated for small efforts. If the proposed compensation is very demanding, it would be unlikely to have desired incentive effect.

Teachers' wages in Russia currently consist of three parts. The first part is a fixed salary. Head of institution establishes it according to a worker's duties, his work intensity, complexity, and achieved results. The complexity of work is determined in accordance with certification. Salary is established on the basis of a worker's professional experience and existence of special education corresponding to qualification groups. Salary of teaching staff is influenced by promotion coefficients for position held, qualification category and working duration. Wages provision for employees of an institution may include the conditions for application of incremental coefficients depending on funding of the educational institution. They may be applied to salary increasing of employees for their academic or honorary degrees.

The second part of teaching staff's wages includes compensation payments. They include bonuses for combination of jobs or professions, for performance of duties of

a casual worker, for workload increase, etc. Compensatory payments may also take into account special conditions having an impact on health, additional workload of teachers involved in checking notebooks or working with a special class of students, etc. One third of a salary performs an incentive function of stimulating payment.

The structure of teachers' wages is designed to attract teachers with the necessary qualifications and experience. Compensatory benefits take into account characteristics of work performed by employees in a particular educational institution. Boldysheva (2017) believes that stimulating payments reward employees for efficient and quality work (Boldysheva 2017).

The challenge of motivating teachers is that their work's quality is difficult to measure. In many cases, incentives designed to improve desired outcome may lead to unintended consequences instead.

The United States has repeatedly introduced reforms to encourage teachers to work. In the 1960s and 1970s, the United States witnessed a surge in interest in reforms to pay teachers for their merit. In the 1980s, more than 99% of teachers were again paid on the basis of a single salary scale. However, in the early twenty-first century, a concern was renewed in the United States about the effectiveness of the current system of incentives for teachers, noted Umansky (2005). This is due to the characteristics of teachers' labour market. Under conditions of high job security and a wage supplement, quality work is impossible to promote. These problems, according to Amjat (2017), stimulated a new interest in experiments on job incentives (Amjat 2017).

Numerous studies around the world show that the level of teachers' education, their work supervising systems, have a positive influence on achievement of pupils, as Swain et al. (2019) point out. However, these factors, by providing incentives to teachers, have a mixed impact on teachers' satisfaction with working conditions. The working conditions and requirements for teachers in regular schools and status schools (lyceums and gymnasiums) vary considerably. There is a high differentiation of teachers' wages in different regions of Russia, asserts Dediushko (2019).

Despite the efforts to develop a teacher incentive system assessesing teachers' performance from different angles, it only partially affects the quality of teachers' performance, noted Kalashnikov and Sharov (2016). Introduction of indicators to calculate bonuses or penalties, according to Fursov (2014), encourages teachers to focus on them (Fursov 2014). Teachers are expected to ensure social, personal, creative, physical and intellectual development of children, as noted in Harris's (2020) article. However, a strict incentive system may lead to a reduction in the learners' knowledge quality when formal indicators increase.

A number of factors are important for incentives. These include indicators used to measure teacher performance. The ways in which these indicators are estimated are also important. In the works of Kalmykova and Solovova (2017), Manchevskaya (2017) the incentive system's effectiveness was noted to depend on teachers' understanding and recognition of their fairness.

3 Methodology

The purpose of this article is to study the attitude of teachers towards their work stimulating system on the basis of results analysis of a sociological questionnaire carried out in Tolyatti in 2010, 2012 and 2018. In 2018, 858 teachers from 24 schools in Tolyatti participated in the survey. The majority of participants in the study (62%) are pedagogical teachers. About one third of the respondents (30%) were primary school teachers. The school administration represented 8% of the respondents.

Qualifications of most of the teachers surveyed are quite high: 55% of the respondents have the highest or first category.

Almost half of the surveyed teachers (47%) work at 1.5 rate. Slightly more than a quarter of teachers (28%) spend 28–35 h per week working (less than 1 rate). 16% of teachers have a workload equal to one rate. The workload of 9% of teachers corresponds to two rates. Thus, 44% of the respondents most often work between 19 and 36 h per week and 56% of the teachers work more than 36 h.

4 Results

Assessing their attitude to the existing pay and incentive mechanism, teachers divided into almost two equal groups: those who fully endorse and support it—48%, and those who disagree with many things—44% of the respondents. Respondents who were indifferent to the mechanism of calculating incentive payments turned out to constitute 8% of all.

77% of deputy principal and principals surveyed expressed their approval of the incentive system. However, 19% of administrators indicated that they did not agree with many aspects of the mechanism.

47% of subject teachers fully approve and support the incentive system. The most displeased teachers are those at primary school level, with 53% of the respondents disagreeing.

Satisfaction with the system of incentives to work significantly depends on whether the teacher is leading the classroom. Class supervisors were noticeably more likely to disagree with many of the principles of the pay mechanism (47%) than teachers who were not class supervisors (34%).

Attitudes towards the system of teachers incentive work depend directly on their work load. The higher the workload, the lesser is the teacher's satisfaction with the bonuses.

Dissatisfation with this issue is also growing with the increase of teaching experience of the teacher surveyed.

Teachers who disagreed with the current incentive system overwhelmingly noted that bonuses were not based on the quality and performance of their work, and that their salaries were significantly lower than under the old pay system.

Teachers who disapprove of the incentive payment mechanism have more often noted that in order to obtain high bonuses, it is necessary to work with a large number of students, to be on good terms with management, and to perform jobs that are evaluated most.

The aim of the study was to determine which aspects of pedagogical work more or less affect the distribution of teachers' salary increments.

In teacher's questionnaire the question was: "What kind of work must an employee of your institution perform in order to receive high bonus increments in accordance with the valid criteria of wage and incentivising of teachers' work?". Respondents could choose a number of options.

78% of the respondents cited preparation pupils for competitions and Olympiads as grounds for incentive allowances. 72% of the respondents indicated that they had participated in competitions for professional excellence. Roughly the same number of the respondents noted high results of pupils in examinations, Olympiads and competitions (71%).

It must be mentioned that the school administration have referred to these aspects more often than teachers. Nine out of ten representatives of administration consider successful performance of these types of pedagogical work to be the basis for a high incentive fee.

More than half of the surveyed teachers indicated that new technologies needed to be introduced into educational and learning process in order to obtain high bonuses. This was 53% of the total answers.

40% of the respondents considered that in order to receive high salary increments, it is necessary to improve their qualifications, and 36% considered that documentation had to be done correctly and in a timely manner.

24% of the respondents believed that positive feedback from students parents have an influence on amount of incentive payments. Other versions of the answer are noted by the teachers much less frequently: 15% of the respondents pay high bonuses for work with a large number of students, 13% for work with the highest rating.

The need to have a long working experience in order to obtain high incentive bonuses was noted by 9% of the respondents, to be in good relations with a administration—7%.

Classroom supervisors were most likely to acknowledge that the current pay criteria includes timely documentation and positive feedback from pupils' parents.

The higher educational workload of teachers, the more they noted in the questionnaire the need to acquire high qualifications and to prepare reports in order to receive high payments.

The teachers' answers to this question should be considered in dynamics. Analysing the monitoring of this problem of 2010, 2012, 2018 explicates that there have been no fundamental changes in teachers' responses. However, some points should be noted.

The number of teachers who noted the importance of preparing students for competitions and Olympiads increased from 71% in 2010 to 78% in 2018.

Compared to 2010, there was a 12% increase in the number of respondents emphasizing the importance of teachers participating in professional competitions to obtain incentive payments. The impact of high qualifications on the level of the surcharge was 16% more in 2018 than in 2010.

At the same time, the need to introduce new technologies into work, as well as positive feedback from parents, have been mentioned considerably less frequently by teachers this year. Introduction of new technologies in the educational process in 2010 was ranked 1st (74%), and 53% of the teachers participating in the study are now included. The number of teachers who cited positive feedback from parents as a reason for receiving incentive payments decreased from 39% in 2010 to 24% in 2018 (which is 15%).

During the study, the teachers were asked the question: "Does the phrase: "Is the amount of bonus depends on the quality and results of my work?" apply to your institution."

The majority of respondents of the survey (78%) agree that in their institution the amount of bonus largely depends on the results of their work. However, almost a quarter (22%) of teachers do not agree with this statement.

There are more primary teachers among those who do not agree. Also "dissenting" is more salient among those who are not satisfied with their teaching workload and those with a teaching load of 36 or more hours per week.

Slightly more often than not, respondents with a teaching experience of between 16 and 25 years disagreed with the value of bonus based on results of their work.

Compared to similar studies in 2010 and 2012, attitudes of teacher have changed. There has been an increase in the number of respondents not considering the amount of bonus to depend on the results of their work. Specifically, from 14% in 2010 to 22% in 2018. Accordingly, the number of teachers who agree with this bonus principle has decreased from 86 to 78%.

The participants in the study were asked about the impact of existing stimulating system on the quality of teachers' work. Slightly more than half of the teachers (52%) who participated in the study believe that the current wage system improves the quality of work and performance of professional activities.

12% of the respondents stated that the wage system had a negative impact on quality of work, as bureaucratic aspects had to extensively be dealt with.

37% of the total number of teachers surveyed indicated that the current pay and incentive mechanism did not have a significant impact on their performance.

Teachers who are not in charge of classroom management were more likely to have a positive impact on the system, with 58%, and half of the supervisors (49%) to consider the system to be an improvement in performance.

The impact of the incentive system on quality of work depends on respondent's position. School administration preferred the positive impact of the existing payment mechanism on quality and performance (83%).

Among teachers who do not hold administrative positions, the most positive influence in this case is observed by those teaching subjects on average and senior level. Among them, 52% considered that the incentive system improved performance. Accordingly, 38% of the survey respondents considered that the system did not have

a significant impact on their activities, and one tenth of subject teachers considered that the system undermined quality of work.

Primary school teachers were slightly more likely than others to say that the system of work incentives did not have a significant impact on the result (42%) or that it did not lead to a deterioration in the quality of work at all (15%). They were two times less frequent to mention the positive impact of the incentive job system on its results (43%), compared to their school administration.

Respondents were asked how the incentive system affected their wages.

One third of all teachers surveyed (33%) indicated in the questionnaires that the current system of job incentives did not affect their salaries. 29% of respondents reported higher wages. 22% of teachers stated that their wages had fallen since the introduction of incentive system. 16% of respondents were unable to assess impact of the incentive mechanism, as they worked only under the current pay system,

Teachers with more than 16 years of service were twice as likely as their less experienced colleagues to claim that salaries do not depend on bonuses and remain at the same level.

The assessment of teachers' wages after introduction of the incentive mechanism depends on position they hold. 59% of the school administrators report salary increases due to introduction of an incentive scheme. They were twice as likely as teachers to increase their salaries as a result of stimulating payments. Among teachers, only 27% of the respondents indicated this option.

The reduction in real salaries after introduction of the new employment incentive mechanism was more frequently cited by primary teachers, namely by 32% against 19% of subject teachers and 13% of school administrators.

The highest level of support for the payment of salaries and allowances to teachers is provided by the school administration. Those who are dissatisfied with the existing system of renumeration are more likely to be among primary teachers.

5 Conclusions

The survey showed that the attitude towards the current renumeration system and incentives for workers in educational institutions is mixed. When the system is considered on the basis of the principal agent theory, it contributes to the consolidation of the principal's functions in the administration of educational institutions. The system of incentives for teachers is undoubtedly beneficial to the school administration, as it enables to select staff members who are loyal to requirements and, conversely, to screen out those who are not.

Almost every second teacher surveyed fully endorses and supports this payment mechanism (48%). However, 44% of the respondents stated that they did not agree on many aspects. The effectiveness of the incentive system largely depends on the teaching load of the teachers. According to the results, about half of the teachers surveyed (56%) work at one and a half or two rates. Thus, ability to cope with high workload of teaching staff determines the salary increases of a large proportion of

teachers. Under such employment conditions, the impact of incentive payments is reduced.

Most teachers report incentive payments to be aimed at encouraging teachers who participate in competitions to work with well-trained pupils. Accordingly, they are more likely to win a high prize for training the winner of the Olympics or for the maximum points of the pupils at the Unified National Exam, thus, the incentive system is predominantly oriented at the teachers of the high school subjects. To a lesser extent, it takes into account the characteristics of primary school teachers, as well as those teaching less popular for the UNE.subjects.

Although the system of incentive payments has been functioning since 2008, the impact of the incentive system on teachers' work quality needs to be improved. This is evidenced by monitoring data showing that the system of job evaluation criteria adopted in 2010 has changed. These results in incentive payments have less impact on the quality of teachers' work than at the beginning of the reform.

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Internet Space as an Innovative Mobile Employment Resource for a University Student: Socio-economic Aspects

Tatiana N. Ivanova

Abstract The article explores the features of the Internet space as an innovative mobile employment resource for a modern university student. The article includes a meaningful empirical experience of a large-scale prolonged sociological study on youth employment. The article was written as part of the implementation of projects: in 12 areas of strategic development established by Decree of the President of Russia of May 7 2018 No. 204 "On national goals and strategic objectives for the development of the Russian Federation for the period up to 2024 year" and Decree of the President of the Russian Federation of 09.05.2017 No. 203 "On the Strategy for the Development of the Information Society in the Russian Federation for 2017–2030 Years." The study of the Internet as a resource of employment and employment, as a source of jobs and as a tool of labor is an important element of analysis of changes that contribute to the development of the Russian economy and ensure more effective interaction between workers and employers. The author focuses on an empirical study on the transformation of labor in the information society, which is controversial. Knowledge of information technologies will help modern students of humanities and technical areas to solve issues of employment, career growth, opening their own business, raising wages and additional income in a faster and mobile way.

Keywords Internet space · Youth · innovation · Mobility · Employment · University

JEL Codes J6 · J60 · Z1 · Z13

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1 Introduction

Currently, in a society dominated by the service sector, the role of information technologies is increasing, computerization is taking place, the Internet occupies an integral part in the life of almost everyone. Today, the development of Internet employment is taking place. This phenomenon is characterized by the fact that a person can, anywhere, fulfill his work duties. The employee has the opportunity to choose the right time and place to work, while performing work qualitatively and on time. This type of employment is suitable for young people, especially for students. Thanks to Internet employment, a student can combine study and work.

In order to determine how relevant Internet employment among young people is, their attitude to this type of employment, a sociological study was conducted. A questionnaire was chosen as the research method, since this method allows you to study many opinions identified by population groups regarding questions of interest.

The theoretical basis of this study was the published works of such scientists as Ivanova et al. (Ivanova and Pakaeva 2018; Ivanova 2016, 2017a, b), Vasenkin (2015), Levashov (2016), Sukhove (2011), Popov (2011), Sazonova (2018) and Stegniy (2013).

2 Materials and Methods

The received data was processed in SPSS 2.0. According to gender, respondents were divided as follows: 50%—women, 50%—men.

In the question of material situation, the majority of respondents (60%) chose the "Average (sometimes I experience material difficulties)." The option "Above average (most often I have no material difficulties)" was noted by 24% of respondents. The 3rd place in terms of percentage ratio was taken by answer options, such as "Excellent (I give up almost nothing)" and "Below average (I have to refuse in many ways)," they amounted to 7%. The rarest (2%) option was the answer "Very difficult (barely making ends meet)."

94% of respondents to the question "Are you married?" answered negative and 6% answered positive.

The largest part of respondents were students of 3 years (41%), students of technical areas—65% and humanities—15%, the smallest students of 5 years (5%). First-year students accounted for 13% (technical students—2%, humanities—25%), second—17% (technical students—8%, humanities—27%), fourth—24%.

We can say that among the people who took part in our survey were people who have different status characteristics and occupy very diverse positions in society, which allows us to identify the whole range of different points of view on the problem we are studying.

TSU students were asked the question: "What kind of computer equipment do you use?" "Personal computer and laptops" (86%) and "Tablets and smartphones" (84%)

are the most common computer technology. There are no special differences between the areas of study. The first answer was chosen by 88% of students in technical areas, the second—83%. 83% of humanitarian students chose the first option and 85% the second option. The rarest answer is: "Multimedia installations" (4%) in the entire array. This answer was chosen only by students of technical fields.

In such a way, the most common computer tools among students of two areas of study are tablets, smartphones, a personal computer and laptops. Multimedia installations are used only by students of technical fields.

The second question of the questionnaire: "Why do you use computer technology?" The most common answers were: "Communication on social networks," "Search for information, news," "Entertainment (games, watching movies, listening to music)." A noticeable difference between students of different directions was manifested in the answer "Entertainment (games, watching films, listening to music)." 71% of technical students chose this answer (by array 77%). Students of humanitarian areas more often noted this option (83%). The option "Educational programs" was noted by 27% of respondents. Students of technical areas more often chose this answer (35%), and students of humanitarian areas less often (19%). The rarest answer was the option "Purchases, purchases of services," noted by 9% of respondents.

We can make a conclusion that students use computer technology, mainly for communication, search for information and entertainment. Technical students more often use computer technology to view educational programs. Students of humanitarian areas more often use computer equipment to make purchases, services, than students of technical areas.

In our research, we found it necessary to find out how often students use the Internet during the week. 93% of respondents chose the answer option "Every day." No student chose the answer option "Once a week." There were no differences between the areas of study. 6% of students use the Internet 4–5 times a week. 1% of students 3 times a week.

We asked the question: "Do you think that your knowledge of information technologies will help for employment, for raising the career level, for opening your own business, for raising wages, for additional income." Let's consider students who have given a positive answer to this question. 86% of respondents believe that information technology will help for employment, 83% are students of the first group (technical direction) and 90% are students of the second group (humanitarian direction).

69% of respondents agree that knowledge of information technologies can help to increase career levels, 67% of students in technical areas noted the answer "Rather yes" and 71% of students in the humanitarian field of study.

69% of students agree that ownership of information technologies can help to open their own business, 37% of students in the technical field consider 71% of students in humanities.

61% of students say that information technology will help to increase wages, for additional income, 54% of students in technical areas answered 69% of students in humanities.

Thus, it can be said that mainly, students believe that information technology can help in all the tasks presented by us. Students in humanitarian fields more than

students in technical fields noted positive answers in that the possession of information technologies can help in many tasks: for employment, for raising career levels, for opening their own affairs, for raising wages, for additional income.

We asked the question: "What do you think, at what level do you know about computers?" The option "At a professional level" was given by 6% of students. Among students of technical areas, 2% noted this answer, among humanitarian students—10%. The answer option "At the advanced user level" was expressed by 41% of students. The first group of respondents (44%) approves this way, and 37% of students from the second group approve this option. Half of students describe their level of computer technology proficiency "at the user level." 52% of students in technical areas noted this option and 48% of students in humanitarian areas. Only 3% of students believe that they have the skills to use information technology at the beginner level.

Therefore, we will conclude that at the professional level, students of humanitarian fields have more proficiency in computer technology. There are many students who are at the user and advanced user level in technical fields.

Next, we asked the question: "How informed are you about the possibility of employment and work through the Internet?" 39% of students are well informed. 51% of respondents, 48% of students of the first group and 54% of students of the second group are not sufficiently informed. Not informed about employment opportunities via the Internet 10% of students.

We will conclude that students of technical and humanitarian fields are "well informed" in equal numbers. The "Not Enough" option was noted by technical students more often than humanitarian students. Students of technical fields are not informed more often than humanitarian ones.

In order to identify the most common professions in Internet employment among students in technical and humanities fields, we asked the question: "Which of the following professions on the Internet are you familiar with?".

The most popular answer was Blogger, 76%; 83% of students in the first group approved this answer, 69% of students in the second group gave the same answer. This suggests that students of technical areas are more familiar with this profession than students of humanitarian areas.

The next frequent answers were "Translator" (61%), in the first group students chose this answer less often (50%), and in the second—more often (73%). The answer option "Administrator of social networks" (56%) was noted by 67% of students in technical areas and 44% of students in humanitarian areas. 55% of students responded with a Web Designer response.

Students of technical and humanitarian fields less often noted the following professions: "Internet Project Manager" (19%), "Architect" (14%), "Context Advertising Specialist" (11%).

In order to identify the positive aspects of Internet employment, the question was asked: "How do you think that of the following, reflects the positive aspects of Internet employment?" The free schedule is the most frequent answer, it was chosen by 86% of students in the array. The next option "The ability to combine work with other activities" (71%). The "convenient place of work" closes the top three most

frequent answers, 67% of students answered this way. Fewer students responded: "Accessibility to each" (23%) and "Opportunities to increase income" (26%). There are no differences between the responses of students in technical and humanitarian fields in this matter.

Therefore, the most positive feature of Internet employment for students, both humanitarian and technical areas, is the free schedule and the ability to combine work with other activities. The only difference: students of technical areas chose the answer "self-development" more often.

Next, consider the negative aspects of Internet employment. The question was asked: "What are the negative aspects of Internet employment?" "Fraud" is the most common answer, it was written by 78% of students in the array. The "High Risk" option was noted by 50% of students, 46% of students of the first group answered so, the second 54%. 48% of students chose "work variability." 33% of respondents noted "Absolutely everything depends only on you." An interesting difference was revealed in the response "Lack of social guarantees," 46% of respondents indicated the option. The first group of respondents responded much more often (56%), and the second—less often (35%).

In such a way, the most negative side of Internet employment for students of humanitarian and technical areas is "Fraud". Students of technical areas more often chose the option of "lack of social guarantees," and students of humanitarian areas "high risk."

The next question is, "If you get an offer for work related to using the Internet, how will you do it?" The first option "I will try to find out as much as possible about the conditions of employment" was noted by 27% of students, 25% of students in technical areas answered this way, and 29% of students in humanitarian areas have responded. 52% of respondents are ready to consider the offer as a possible option, 42% of students of the first group gave such an answer and 62% of students of the second group gave such an answer as well. The offer of work on the Internet is completely not interesting to 14% of students; students of technical areas—21%, humanities—6%. 7% of respondents find it difficult to answer.

Therefore, students of humanitarian areas are interested in offers of work via the Internet more often than students of technical areas.

"What conditions are important for you when considering a job offer related to the Internet,"—was the next question of the questionnaire.

The most frequent answer was "Convenient schedule and place," 75% of respondents chose this answer, 67% in the first group, 83% in the second group. For 66% of students, "The presence of guarantees" is important, in the first group—60% of students wrote this option, in the second group—73% of students. Options: "Stability" (45%), "High wages" (58%) are important, both for students in technical areas and for students in humanitarian areas. The option "Career advancement" (25%) in the first group was approved more often (33% of respondents), in the second group they noted less often—17% of students chose this option. The answer "The opportunity to open your own business" was given by 24% of students. 31% of students in technical areas noted this option, students in humanitarian areas—17%. For only 5% of respondents, "Employment by profession" is important.

In such a way, the most important condition for students in considering job offers is the availability of a convenient schedule and place, and employment by profession for youth of the post-industrial world does not play a significant role. Students of technical areas noted options for answers "the opportunity to open their own business," "career advancement," more often than students of humanitarian areas. Students of humanitarian areas more often chose answers: "convenient schedule and place," "availability of guarantees."

In order to identify important qualities when working on the Internet, we asked the question: "What qualities do you think are necessary to successfully work on the Internet?" The answer option "Proficiency in foreign languages" was noted by 32% of respondents. In the first group, 23% of students answered, and in the second group—42% of students responded with this option. The answer "Good level of knowledge of information technologies" became the most frequent, 73% of students surveyed chose it. Students of technical areas noted the response more often (79%), humanitarian less often—67%. The option "Entrepreneurship, activity" is approved by 40% of respondents, in the first group 35% of students wrote this option, in the second—46% of students. The Stress Resistance option was chosen by 32% of students. In the first group, 25% of respondents wrote this option, in the second 40% of students. The answer "Sociability", was given by 35% of students, in the first group 40% of students chose this possible answer, in the second—29%. Less often they chose the answer: "High level of education," 22% of students responded. The answer "High performance" 14% of students surveyed considered it necessary to note this option.

3 Results

Therefore, the most common computer tools among students of two areas of study are tablets, smartphones, a personal computer and laptops. Multimedia is used only by students of technical fields.

Students use computer technology mainly for communication, searching for information and entertainment. Technical students more often use computer technology to view educational programs. Students of humanitarian areas more often use computers to make purchases, services, than students of technical areas.

Basically, students believe that knowledge of information technology can help in all the tasks presented by us. Students in humanitarian fields more than students in technical fields noted positive answers in that the information technologies can help in many tasks: for employment, for raising career levels, for opening their own businesses, for raising their wages and for additional income.

At the professional level, students of humanitarian fields are more proficient in computer technology. Students of technical fields have more proficiency at the level of user and advanced user.

The most positive feature of Internet employment for students, both humanitarian and technical areas, is the free schedule and the ability to combine work with other

activities. The only difference: students of technical areas chose the answer "self-development" more often.

The most negative side of Internet employment for students of humanitarian and technical fields is "Fraud." Students of technical areas more often chose the option of "lack of social guarantees," and students of humanitarian areas "high risk."

Humanitarian students are interested in online offers more often than technical students.

The most important condition for students when considering job offers is the availability of a convenient schedule and place, and employment by profession for youth of the post-industrial world does not play a role. Students of technical areas noted options for answers "the opportunity to open their own business," "career advancement," more often than students of humanitarian areas. Students of humanitarian areas more often chose answers: "convenient schedule and place," "availability of guarantees."

Knowledge of information technology plays an important role in working through the Internet, both for technical and humanitarian students, and high productivity is not so important, according to students. Students of humanitarian fields consider such qualities as: "proficiency in foreign languages," "resistance to stress" are more important when working through the Internet. Students of technical areas noted the options of "sociability, communicability," "high performance" more often than students of humanitarian areas.

4 Conclusion

Therefore, students in technical fields are more experienced in Internet employment, and most students only begin to learn about employment through the Internet.

Having conducted a sociological research, we can say that students today are informed about Internet employment, but not enough. A small proportion of respondents have experience in employment via the Internet. Students of technical and humanitarian fields did not work through the Internet due to possible risks, fraud, lack of social guarantees, but at the same time note many positive aspects of working on the Internet. An important plus of online work for students is the ability to combine work with other activities, primarily with study.

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The Traditional Image of Childhood in Western and Eastern Cultures

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Abstract The purpose of the article is to compare different models of education in traditional societies of the West and East, to build models of the image of childhood in Western and Eastern cultures. The study is based on comparative and comparative typological methods, which allow us to identify similarities and differences in childhood models by comparing the image of childhood in different cultures. The usage of diachronically-synchronic approach helps to reproduce of childhood models in Western and Eastern cultures at the traditional stage of the formation of society is based on data from the United Nations Children's Fund (UNICEF). The analysis of the system formation of family values and punishments of children in traditional societies of the West and East is carried out. The system of inculturation of the younger generation in a traditional society is defined. The parenting systems among different peoples of the world differ at the traditional stage of the formation of society. Many factors influence the formation of these differences: mentality, religion, lifestyle, and climatic conditions. A comparison of the Western and Eastern ancient models of parenting allows us to determine the ethnic identity of the Western and Eastern worlds of childhood, the system of punishment in relation to children, the age limits of childhood, the age-specific characteristics and gender aspects of childhood culture, the upbringing models of the younger generation in different microcultures, intergenerational relationships.

Keywords Image · Childhood · Western culture · Eastern culture · Society

JEL Codes A11 · A12 · D19 · I29 · I30 · J12 · J16 · J79 · O57

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1 Introduction

Childhood is a period of human development and formation. At this stage of lifespan development, a child studies the world around him; he/she develops the necessary skills and learns the culture of the society in which he/she grows up. However, it should be considered that childhood is not just a period of human evolution, but this term has different content among different peoples, in different cultures and at different stages of a particular society development. A comparison of upbringing models in different cultures and different historical epochs determines the specificity of the culture of childhood in macroculture as a whole.

Each country has traditions and they belong not only to culture, but they also concern the significant time as upbringing children. Western and Eastern (Asian) models of education differs greatly. The parenting systems for different nations of the world are various. A lot of factors affect these distinctions: mindset, religion, way of life and even climate conditions.

It represents that, in spite of linguistical and cultural contrasts, the systems of parenting are analogous for the humanity. Nevertheless, all parents consider that the most significant period of their children's life way that the child outgrow healthy and improves his/her skills harmonically. Albeit when it turns to teaching methods, it comes out that every country has its own priorities of upbringing children.

2 Materials and Method

The two cultural paradigms of childhood of West and East are emphasized in the works of Arai (2006), Gopnik (2009), Kon (1988), Kosheleva (1996), Mead (1988), Filipova (2012), Howarth (1989), Krasnoslobodtseva (2009), Mamycheva (2008).

An active scientific discourse is also being conducted on the topic under study in the work of Kagan (1974), which define the theoretical basis of this research.

The study is based on the yearly records of the United Nations Children's Fund (UNICEF). Since the early 1990s UNICEF has developed annual reports on the situation of children in the world. It was established in 1946 as an international emergency organization to help children in Europe ravaged by World War II, and since that time has been focusing on improving the situation of children in different countries. Among the latest reports prepared by UNICEF on the results of research on childhood in different regions of the world: "The situation of children in the world, 2017: children in the digital world", "Social monitoring: social protection of the rights of children and welfare in Central and Eastern Europe, the Caucasus and Central Asia", "Child poverty in Europe and Central Asia: definitions, scale assessment, trends and recommendations" (Mead 1988).

Diachronic and synchronic approaches to the study of childhood are implemented at the macro-social level of childhood sociology. The synchronic approach is required

for comparing the social characteristics of children from different continents and regions within a country.

The usage of diachronically-synchronic approach to the study of childhood is implemented at the macro-social level to consider one object (childhood, generation) in the dynamics of development (diachronic) or different objects simultaneously (synchronous) using the tool for comparative analysis of macro-social indicators (Mead 1988). The vector of the synchronous study of childhood takes shape in an ethnographic and anthropological approach through a parallel correlation of the cultural characteristics of childhood in different countries. At the first period of the twentieth century M. Mead analyzed the characteristics of the creation of the child's personality in different cultures. Social anthropologists and ethnographers consider childhood from the point of view of age symbolism, including normative criteria for age, age stereotypes, symbolization of age processes (Mead 1988).

The usage of sociocultural approach leads to focuses on the consideration of culture for children and children's subculture. With this technique to childhood years, both a category of children and their life way are comprehended as unknown to adult's world. It is accepted that childhood years has a culture, vocabulary, rites, standards that adult people examine with wonder, but usually without accepting them severely. I. S. Kon underlined that the culture of children incorporates a lot of components that are inexplicable to adults and as a result it is determined by them as archaic (Kon 1988).

3 Results

The comparison of the Western and Eastern ancient models of education helps to determine: the ethnic identity of the Western and Eastern worlds of childhood, the system of corporal punishment of children, the age limits of childhood, the age-specific characteristics and gender aspects of childhood culture, models of upbringing of the younger generation in different microcultures, intergenerational relationships generally.

In many traditional cultures, the basis of family life was patriarchy. Everybody admitted that fosterage a young man is a great duty of parents. It must be understood that for many thousand years, for the duration the evolution of the customs of the Chinese nation, an appropriate education by the family was respected. Those parents who only grew children without evolving them correctly were not counted the fully-functional parents (Krasnoslobodtseva 2009).

The form of social organization, where the man was the bearer of power, found its place in ancient China. In imperialistic China, at birth girls did not go through the rite of naming, the birth of male generation was the main purpose of a woman. In southern China, women asked shamans to see what color the flowers grow on the tree of life that was in the sky: red flowers meant the birth of a girl, and white flowers symbolized the birth of a boy, the birth of a girl in the family was equated to tragedy. Aries supposed that the perception of childhood as a separate historical

category appeared firstly to the order of boys, while girls kept the traditional way of life, it did not differ from the adult world (Aries 1999).

One of the most ancient forms of physical impact on a person was the corporal punishment system. The development of the punishment system in ancient Chinese society had been beginning from ancient times, children under 8 years old and the older generation from 70 years old was freed from physical punishment. From the age of seven, the child was instilled with obedience, respect of elders and began to grasp the science. The most important aspect of upbringing a child was the assimilation of the norms of virtues of various kinds. The pedagogical traditions were based on the principle of family, a social education, which was deeply rooted in the history of ancient China. In China, as in all ancient societies, the basis of educational relations was the respectful attitude of the younger generation to the older one.

Family education had been meaningful for not only families and children, but additionally for the developing of society and the civilization as a whole, it was considered that the country must be a family association. From early stage of childhood the children must have understood that he/she had to care not only of his/her community, but as well of the country.

According to Chinese traditions, one can distinguish the important positive qualities of a person: politeness, non-conflict, patriotism, independence, curiosity, hard work, love, and respect for parents and relatives, courage, honesty. These features were the key elements of home education.

The honorable customs and traditions have strongly joined to the life of modern society of China, have turned as an essential part linking with generations with an hidden thread of integrity. Customs of the present and past are contrasted in the life of the family of China, particularly in countryside areas (Gopnik 2009).

Another Eastern country, Japan, occupies a special place in a world culture, the attitude towards children are fundamentally different from the traditional way of upbringing in other countries (Petrunina et al. 2018). The system of corporal punishment of children was absent in ancient Japanese society, the respectful feelings for children was the basis of younger generation's upbringing. Traditional Japanese society had applied the worldview and perception to the category of childhood. Raising a child was divided into three important stages: infancy, adolescence, and youth. The stage of infancy differed from the other stages of growing up by the "permissiveness"; in the period of adolescence, the upbringing model changed to another, which included rigid educational elements in relation to the child. In the period of youth, upbringing was based on the principle of equality, in this period of the personality formation, boys experienced the principles of military discipline, which were combined with Eastern philosophy.

The principles of upbringing girls were different from the system of raising boys in the patriarchal system of traditional society in Japan. From early childhood, the upbringing of a girl was based on prohibitions and suppression of personality, girls were convinced that the most important task of a woman in society was the birth and upbringing of a child (Kosheleva 1996).

It must be noted that India has special interest of the researchers of Asia. The ancient Indian society was divided into castes (varnas), in accordance with which

the goal of upbringing a child was determined in the conditions of the varna. The absence of a single educational model was a characteristic feature of ancient society, so each caste had its own standards of education, and training was mandatory for higher castes. One of the main stages in the educational process was the initiation rite, that was based on a number of ethical and legal norms, the main feature of it was the careful regulation of the life of the society of India on the foundation of old traditional foundations and customs, given its social status and origin. The rite of initiation was held for each caste at a different age: 8–16 years old—an Irakhman, 11–22 for a Kshatriya, 20–24 for a Vaisya. The Sudras did not go through this ceremony, that rite was dedicated to the completion of the childhood period and symbolized a new stage in the life of an Indian. The main goals of raising children of higher castes in ancient India by the middle of the 1000BC were physical development—hardening, the ability to control your body; mental development—clarity of mind and rationality of behavior; spiritual development—the ability to self-knowledge. It was believed that a person was born for a life of fullness. The children of higher castes brought up such qualities as love of nature, sense of beauty, self-discipline, self-control, restraint. The samples of education were drawn primarily in the tales of Krishna. In the legends, a detailed description of family-social education in Ancient India was given (Howarth 1989). India has a patriarchal system with the rule of men. Up to now, a different attitude to female and male children remains in the country.

Ph. Aries believes that childhood is a category that is represented by various social definitions in different eras, although at that time it does not connect the history of childhood development with the evolution of society in socio-economic terms. E. A. Kurulenko, unlike Ph. Aries, believed that the change in the content of the childhood's concept is directly connected with evolution in the socio-economic structure of society (Aries 1999).

The creation of Western teaching tradition started in ancient Greece. It was then that the Spartan and Athenian forms of educating and training developed, that started the first source for the developing of Western pedagogical practice and theory. If Sparta demonstrated to the world a form of military physical and public education, then Athens was a complex of harmonious and comprehensive human improvement. It was that the perfect model of teaching a free imaginative personality, contained in the polis (a public style of life), was proportionate with the primitive understanding of the universe. The pathos of the practice of training and education in ancient Greece impregnated the idea of competition. Youths, adolescents, children usually fought in music, dancing, gymnastics, verbal disputes, claiming themselves and respecting their greatest qualities. In the tractate "State" Plato was the first to bring forward the concept of teaching a person through the life (Arai 2006).

The Western model of the upbringing and formation of the child's personality had its own characteristics. The life of boys and girls was different, but until the age of seven, all children were brought up in the womenfolk. The girls had mentors who taught them needlework and dancing. At thirteen to fifteen years, they could get married, the girls carried the toys to the temple of Artemis, it testified to the fact that childhood ended and they became adults. In ancient Greece, the birth of boys was given greater preference; it was the boys in the future who became full-fledged

citizens of the society. For the first time in Greece, periodization of the life path was appeared, on the seventh day after birth, the child was given a name, and a fete was held. At three years old, the child ceased to be considered an infant and was brought up by his mother until the age of seven; upon reaching the age of seven, the boys were sent to receive knowledge in school. I. S. Kon believed that symbolic age represents the social expectations of a certain behavior for various kinds of life phases (Kon 1988).

In ancient Rome, the birth of a child was a high day, which was notified to all neighbors by wreaths hanging on the doors. The father raised the baby whom they laid on the ground in front of him; it meant that he recognized a baby as a legitimate child, also he could reject him, and then the newborn was thrown out. Only under Alexander Sever's rule, the throwing of children was declared a crime that amounted to murder. Education in ancient Rome had its own features, as in most ancient societies, the main purpose of education was the formation of morality. The family was involved in the process of personality formation; the social institution was of great importance in the life of a child. The father was engaged in moral, physical, and religious education, brought up male features in a male child, helped to master military affairs. Mother was engaged in upbringing a daughter and paid attention to practical education. The leading role was played by home education; the head of the family was responsible to the community for raising children. Boys under the supervision of a father under 16 studied homework and field work, the art of gun ownership. In the families of the Roman nobility dominated by home schooling with the invitation of Greek teachers, that tradition had been preserved throughout Roman history. In the period of prosperity of the Roman Empire, the state education system was given priority. Fine arts—music and singing—were mercilessly excluded from the educational program. Elementary education was given in trivial schools, those were private schools with the indefinite duration of study and various programs where children from more affluent citizens were trained, and it was common that girls also studied.

In ancient Rome, it was believed that violence gave rise to slavish qualities, therefore, the preference was given to the approval, and praise of the child, there was no system of physical punishment. In general, the educational system in Roman society was harsh; children were taught endurance and dexterity in the terms of severe discipline.

In traditional culture, childhood is a separate world where the child was the object of pedagogical efforts of the adult world. The researches by M. Mead in the field of anthropology had shown that the period of a person's growing up in different peoples' societies is not the same (Mead 1988). A great influence on the different nature of the childhood's phase was exerted by the environment and worldviews of the nations. At the traditionalistic stage of evolution of the world of children, the role of the child in society was clearly defined. The world of adults was separated from the children's world, adults clearly performed their duties, and children were fully prepared to fulfill their future roles. According to M. Mead, cultural traditions, developing according to their own laws, determine the content and nature of the existence of the concept of childhood. Each culture has its own definition of "being

a child", how children should look and act, what is expected of them, and what is not (Mead 1988).

The system of society in traditional culture as a whole was simple; the basis of such a society was the preservation of the traditional cultural order. The veneration of ancestors was a fundamental feature of traditional society and played a large role in educating the future generation. The change in the social system was slow; customs, traditions, and rites were the basis of traditional culture (Akhmetova and Ivashchenko 2018). It was forbidden to have an opinion at various problems; the manifestation of individuality in a traditional society was not approved. Therefore, popular opinion, as one of the elements of mass conscience, had a great power. The position of society in relation to the renewal of the traditional way of life was sharply negative. According to I. S. Kon, the society carried out the process of socialization of the child in accordance with the requirements of the society, what role it had to play as a result of cultural socio genes is and what values it had to master (Kon 1988). At the heart of traditional culture, the authority of the elders was high, so the basis for the socialization of children was imitation of adults. The older generation was the keeper of life knowledge and attitudes. The accumulated experience of the elder generation was given on to the young generation; the values of the benchmark of the two generations were the same. The image of a child that developed in each culture was a variant of ideas about it; it was suitable for a certain historical era and culture.

4 Conclusion

The western and eastern models of parenting in traditional societies had certain similarities and differences. The main difference in cultures was the punishment system, the presence of such a system in society was considered as a sign of a totalitarian society. In the West, the system of execution of sentences was more perfect, it is believed that the beginning of legal traditions was taken there, on the territory of old Rome and Ancient Greece. In general, childhood was a phenomenon with clearly defined ethno cultural dominants. In all cultures there was a low social status of childhood according to age or gender, the principal role of the elder generation had a great impact in the system of education. The type of child-parent relations in a traditional society was characterized by an orientation to copying the adult behavior (Krasnoslobodtseva 2009). The world of adults was not separated from the world of children; adults played a great role in the establishment of the individuality of the child.

It is affordable to conclude that the family unit was an complex and important construction that impacted the development of society, and had a great significance in both Western and Eastern worlds. In Eastern culture, the society was involved in growing a child, and in Western societies, the growing children fell on the heads of their parents. It should be discovered that now, the relationships in the nowadays eastern family relation is closer but more limited by the framing of the accepted roles. In Western society the relationships between members of the family are not

so close; it implies the dissociation of family's members. In Western society, elder generation criticizes the child—to achieve progress in society—to become wealthy, while eastern generations orientate the child to spiritual interaction and improvement with society. Western families have no connection to parents, a human can leave his roots for some profits, and the ancestry of the family name can only be used as an item of pride. The eastern order is described by great regards and even the cult of forefathers. However, the family plays an important role both in eastern and western cultures.

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Methodological Aspects of Cultural Study of the Chinese Power Image

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Abstract The purpose of this study is to analyze methodological bases of studying the image of power within the framework of a cultural approach. This study is fulfilled within the framework of a cultural approach aimed at analyzing the features and key ideas of a methodological aspect of studying the image of the Chinese power. The methods of studying culture which constitute the theoretical basis for studying the image are aimed at identifying the degree of socio-cultural transformations in society, prestige and the legitimacy of the power. As a result of the analysis of the methodological apparatus of cultural studies, research methods have been analyzed. The theoretical foundations of the implementation of the cultural approach to the study of power as a cultural phenomenon are considered. It has been established that the main idea of the cultural approach to the study of the image of the Chinese power is in its interpretation in the context of national culture. In its turn it is manifested in the totality of interests, the ideological orientation of the created cultural objects, the value bases developed in the mass consciousness of social groups and the entire society, the level of knowledge, competencies and civilization. The novelty of this study is in the implementation of a cultural analysis of the phenomenon of the Chinese power which is traditionally considered within the framework of philosophical and political science. Such an approach allows expanding the understanding of the complex phenomenon of Chinese power.

Keywords Methods of cultural approach · Chinese power

JEL Codes Z1 · Z18

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1 Introduction

Problems associated with nature, forms of manifestation in society, the functioning of the power are reflected in many areas of humanitarian knowledge and its research is of an interdisciplinary nature. Historical, sociological, political science and psychological methods to the power research have become widespread. Currently, the problem of the power has acquired particular relevance, the aspects of which lie in the interaction of sociolinguistics, psychology, cratology and cultural studies. Moreover, greater importance is attached to the power reflection in the field of cultural area that gives possibility, to a certain extent, to assert the advisability of introducing a new direction of research into cultural sphere—the culturology of the power.

The analysis of the image of the power through the prism of national and cultural specifics allows identifying those features and unique characteristics that cannot be established using the methods of political science, philosophy, sociology, or psychology. The researches in this sphere are rather young and do not exist long by works of scientists who consider the power as an element of culture (Musalitina 2019). However, the issue of considering the power as a cultural phenomenon remains insufficiently studied. The cultural approach allows using a wide arsenal of methods for analysis of the image of the Chinese power in addition to general scientific methods of cognition.

The main purpose of this research is analyzing the methodological apparatus for studying the image of the power within the framework of a cultural approach.

Research objectives:

1. To define the peculiarities of study of the image of the power as a cultural phenomenon.
2. To analyze the methods of studying culture that is applicable to the study of the Chinese power image.

2 Materials and Method

This study is fulfilled within the framework of a cultural approach aimed at analyzing, identifying the features and key ideas of the methodological aspect of studying the image of the Chinese power. The methods of studying culture which constitute the theoretical basis for studying the image of power: semiotic, systemic and structural methods, which are aimed at identifying the degree of socio-cultural transformations in society, the value bases of culture and power as an integral stable system, trends in improving the image of the Chinese authorities, communist party and its authenticity, the head of the state.

The fact is that the power is in the field of research of a great number of humanitarian sciences. Because of it the analysis in this work is fulfilled with the use of a complex of different methods and interpretations. Considering power through the prism of culture, there is no limitation of its understanding as a purely political

phenomenon. This study of the image of power in the cultural sphere is based on its interpretation in a broader sense, namely, as any opportunity to impose one's will within the framework of social relations (Morris 2017). This kind of concept of power allows considering its various manifestations in the context of culture: family, social, symbolic, political, state power.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as Chebanyuk (2010), Nikitin et al. (Nikitin and Semenov 2019), Rozin (2014), Shuneyko et al. (Shuneyko and Chibisova 2017), Sun (2020), Lotman (2020) and Veit-Brause (Veit-Brause 2017).

3 Results

Culture and power are in a complex, multifaceted interaction. Power, on the one hand, seems to be an important element of national culture but from the other point of view, it forms the culture itself, influences on its formation, and largely determines the vector of its development.

The main idea to research the Chinese power as a phenomenon of national culture is to comprehensively analyze this social phenomenon taking into account the uniqueness and national characteristics of Chinese culture. Also, this approach allows revising and overcoming the existing sociocultural oppositions, dichotomies through synthesis, to consider the phenomenon under study through the prism of culture.

The relevance of considering the authorities of modern China in the sphere of cultural national peculiarities is described in the researches of Russian, European and Chinese specialists. Special attention should be paid to the works of the following authors carrying out the research on the power in the context of a culturological approach: I. A. Ilyina, V. G. Ledyaeva, V. A. Podoroga, A. E. Presnyakova, G. P. Fedotova, O. M. Freidenberg, S. Yunjie (Chebanyuk 2015; Uspensky 1996). Chinese researcher Gao Liu offers a comprehensive analysis of the relationship between culture and power, noting that culture forms individual beliefs and desires, including the desire to rule. Thus, culture provides the means by which people understand the world (Levitskaya 2011).

Comprehending figure of oriental nation state as a phenomenon of cultural reality, it is necessary to determine the structural core of culture as a system value. The system object should become such a core, and, therefore, the subject of cultural studies. The power is such a complex and self-developing system. The power is a constantly evolving phenomenon, a system that requires understanding. Due to this, the subject of culture itself, the process of its meaning-making activity, can become the subject of cultural studies. Due to its integrative nature of knowledge, cultural studies can reach a higher level in comprehending such a sphere of human activity as the power.

The next task of the cultural approach is determined by identifying the types of cognitive orientations and models for investigation the image of the Chinese national power. There are three informative models that must be carefully studied: world

outlook, sphere of cultural methods and chronological. This classification allows distinguishing concrete fields on the bases of which the analysis of the power is fulfilled. These fields are observed further:

- ontological basis;
- life structure arranged by cultural system;
- life as a set of symbols;
- cultural aspect of interaction;
- signs and symbols as a basis of culture;
- denominative aspect of culture;
- rules, customs, conceptions, ways of specifying society;
- principles of mutual activity between a person and country;
- attitude of representatives of national traditions to cultural basis;
- considering humanity, innovation of cultural theories;
- change of humans being in the space of historical field.

Taking into consideration mentioned spheres of culture, it must be noted that studying power as a phenomenon which is what the power is, some circumstances, notions, ways of investigation must be thoroughly analyzed.

Different fields of humanitarian science research culture. There are some traditional and habitual approaches to comprehending the phenomenon of culture. The same situation is about the phenomenon of the power which is interpreted by numerous humanitarian methods.

The methods of culture studying changed in two ways: they are somehow integrated into the methodological complex and are transformed, giving rise to a new instrumental integrity.

One of the main principles to analyze the image of the Chinese power is the semiotic method. This method operates with such concepts as “system”, “text”, “sign". The most significant studies in the field of semiotic analysis are presented in the works of F. de Saussure exile, (Fuko2008). The words and issues: Archeology of the Humanities. Moscow, Russia: Progress 2008; Lotman 2000; Uspensky 1996) and others. Semiotic analysis of cultural phenomena operates with categories and concepts of semiotics, aimed at considering the world as an interconnected aggregate system of signs, communicative situations and semiotic systems.

The method is a basic method in the process of investigating the power, since the power is inextricably linked with symbolic representation which largely determines its legitimacy.

The category “structure” is methodologically significant for detailed analyzing of the image, because this principle allows viewing the power as strictly organized phenomenon (Fuko 2008).

The main theoretical provisions of the semiotic analysis of culture, outlined by Lotman (2000), determine the methodological strategy for studying the image of national power in the field of cultural knowledge. Thus, it is argued that the phenomena of cultural nature, including the image of the power as a whole, are supposed to be subordinate to the main structure–national verbal communication.

There is a statement that culture and human communication cannot be detached, because the language do not exist without the culture and the culture do not exist without the means of communication like a natural language in its center. This situation makes it necessary and of particular importance to involve linguistic sources to the practice of dealing with the power image in the frame of national culture.

Considering the symbolic nature of culture as a system, and the fact that symbolism is one of its typological characteristics, the study of power relations involves a detailed examination of the complexes of symbols and signs traditionally associated with Chinese power.

The above considered methodological positions determine the semiotic analysis of different forms of representation. Peculiarity of this analysis is in appreciation in textual nature of culture, assumes that an individual, his actions, behavior, social systems and transformations occurring with them can act as a text. The field of culture is always connected with symbols and sign system.

Culture is supposed to be carefully organized sphere, a special way to appreciate human life, possibility to explain complex phenomenon and processes (Levi-Stross 2001).

In the semiotic space of culture, the image of power is regarded in connection with semantics endowed by different reference groups, in what context it exists.

In this aspect, especially important is interpretation of a person of the first Chinese emperor Qin Shi Huangdi, significant for the ancient historical era, whose deeds, actions, the style of ruling the country caused appearing of a number of several ways of interpretations that rather differ from those supposed to be traditional for Chinese culture and history.

Analysis of the pieces of Chinese ancient art shows that the personality of the Emperor is connected with sacred meaning. He is regarded as the Son of the Heavens and has right for what common people have no right at all.

In various texts of the era, Shi Huangdi was endowed with the meanings of "son of Heaven", "hero of Chinese nation", "Leader of all the Chinese peoples." Ancient Chinese people treated the Emperor as a sacred creature. Many legends were composed about him during his lifetime, which at their core had archetypal structures-images of God, the creator-creator (Chebanyuk 2015).

In conclusion of analising the method of interpriting symbols and signsas a key method in research of the image, one must take into consideration that this method allows one to interpret the symbols and signs that form "cultural texts" associated with the representation of the image of the power in the semiosphere. It is aimed at identifying the symbolic nature of cultural texts, cultural codes that allow interpreting the power as a sign system in the national Chinese culture.

Using the systemic method as the most important method in analizing the image of power has led to the following results. The meaning of "systems" is viewed as the union of a certain group of strictly organized parts of the whole that influence each other and depend on each other. Supporters of this approach are B. Spinoza, G.V. Leibniz, I. Kant, S. Ya. Levit, L. White (Levi-Stross 2001).

Continuity of this system can be revealed by means of a complex analysis taking into consideration a complex of elements as a unseparable union. Necessary and

sufficient number of system-wide characteristics that determine the specifics of the power as a cultural phenomenoncan be achieved by means of applying systematic principle. It is the connection of the elements of the system that determines its structure. As an illustration, the system of ideas and beliefs of the Chinese about the power and its evolution from antiquity to the era of modern China. The only authoritative source of knowledge and regulator of all spheres of human activity for the ancient Chinese were philosophical and religious ideas about the place and role of the ruler, about the system of relations between the ruler and the subordinate, father-son, state-citizen. In the later era of the development of Chinese society, the religious regulators of social life were replaced by the state ideology which together with the formation of the state, formed new views, ideas, and attitudes. Thus, a change in the elements of the system and their new relationships regularly emerging determine a change in the type of administrative and governmental state system and in peronal characteristics (Kuramshina 2013).

Based on the key theses that determine the essence of the systemic method, the Chinese way of development of statehood and the system of the power can be attributed to the ternary system which consists in a certain order (the main principle of the transfer of the power is by inheritance or by constitutional means) (Horyna 2020).

The image of political power must be studied under taking into consideration the sign nature of the power and produce the analysis the system diachronicaly and sinchronicaly.

Thirdly, non-systemic elements with instability are subject to abstraction. Such elements determine the dynamics of semiotic systems and cultures.

Turning to the methodological principle of studying the image dealing with structure as a nominal unit, the power as a cultural phenomenon can be regarded.

It must be noted that the term “structuralism” denotes the direction of analysis of culture, including all varieties of structural analysis, or a direction that chooses the subject of its analysis of structures of varying degrees of complexity. F. de Saussure, R.O. Jacobson, K. Levi-Strauss and others are considered to be the founders of the principle of structure study (Musalitina 2019).“Pattern” and “complex” are the notional rates of analysis of structure.

The frame is a principle of linking separate parts into one complex system, regulating their connection and supporting stable unity of them. Thus, the methodological specificity is besed on the statement that comprehencing of a certain cultural phenomenon, the internal connections of all its elements must be considered. K. Levi-Strauss defined the conditions and rules for structural analysis:

- the need to identify during the analysis stable, repetitive elements in traditional cultures (such is the Chinese culture);
- the methodological strategy of structural analysis is determined by the need to discover, fix the patterns of universal models of human thinking. The main task of the researcher is to study stable mental structures that determine cultural forms;
- the universality of the structure of cultural forms allows makes it possible to transfer it from one artifact to another artifact;

- the strategic aim of structural analysis is to find patterns that are inherent in all cultural texts.

K. Levi-Strauss also offers a certain algorithm for the structural analysis of traditional cultures, including Chinese culture. It presupposes the collection of cultural facts in a synchronic aspect without missing a single element; the formation of a list of facts in relation to which the researcher is interested and which determine, to some extent or another, the essence of the studied phenomenon; systematization of the collected facts: establishing connections between them, classification according to the identified significant internal and external relationships; identification of internally correlative relationships between elements of cultural phenomena of a symbolic nature (including the power); based on the results obtained, building a system of stable internal and external relations, represented by binary oppositions and determining the essential features of an object and phenomenon (Levi-Stross 2001).

Methodology that compose the method and expand the structural method—correlative relationships between elements of phenomena in the system are expressed in oppositions, which, according to the research methodology, go back to universal psychological laws. The system of relations "ruler"—"subordinate" is one of such oppositions.

Summarizing the methodology of structural analysis, it can be concluded that this method is most suitable for describing nominal units of culture which can not be modificated during the definite period of time, used as nominal notions for comrehencing national cultural systems and models.That can explain the reson why political and administrative bodies are analysed with the help of the method of structure. It makes the method universal for investigating different national cultures and humanities.

4 Conclusion

Summing up considering theoretical points of complex culturology study of the national image of the Chinese power, it is stated that the reliability and depth of the study can be ensured only if several methods of studying culture in a complex are applied. This approach allows the researcher to come up with a motivated explanation of the main conceptual characteristics of culture, trends, the specifics of its development at a particular historical stage, to identify internal contradictions that explain both exclusivity and the regularity of these contradictions, the mechanisms of transformation within the time frames.

The study of the image of the power from the position of culture study expand the representation of various manifestations of this phenomenon of definite cultural sphere at concrete time period and art and to the analysis of the characteristic features of the power. The power is seen as the embodiment of those elements of culture that the subjects of political activity already possess or are on the way to achieve or acquire them. Humanitarian approach to researching of the image of the power is

supposed to be of primary notion and special importance, the cultural approach is especially promising. The cultural approach can be used in combination with other humanities to study the power as a cultural phenomenon.

In new cultural and historical conditions there is a need for new approaches, methods in understanding the increasingly complex, dynamic sociocultural processes affecting the sphere of power relations. Since the power is a complex constantly undergoing change and incomplete system in its development, the process of its cognition and the search for new theoretical and methodological foundations is especially relevant.

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Colour Phenomenon as a Problem of Scientific Cognition from Antiquity till Modern Age

Natalia S. Soboleva

Abstract The purpose of the chapter is to carry out the survey in understanding "color" phenomenon by outstanding scientists and philosophers; to analyze evolution of their theories and ideas, which influenced on modern state of the issue. The author's historical research in "color" phenomenon comprises one another consequently changing epochs, beginning from antique age and up to modern time. The evolution of understanding color and light nature, color vision mechanism by the most famous personalities of different epochs are analyzed from the retrospective point of view. The author also reveals the most significant ideas and observes their historical development resulting in appearance of modern methods and approaches concerning the study of "color" phenomenon nowadays. It is shown that basic theoretical foundations had been already developed in ancient times by the philosophers who lacked the scientific instruments. Their most prominent results were carefully kept during the Middle Age and transmitted to the times when color phenomenon acquired its scientific ground. The author reveals color physical theories as determinate in modern color studies including its psychological and humanitarian aspects. The retrospective method shows the significant results and their transmission by scientists, reveals all pros and cons in color study of different ages.

Keywords Color phenomenon · Color vision · Cognition · Evolution · Retrospective review · Prescientific · Scientific periods

JEL Codes Y3 · Y5

1 Introduction

Nature defined in such a way that a human being was surrounded by a world of various colours from the beginning of human existence. Attempts to reveal the colour nature

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secret and to understand the cognitive process by means of visual perception mechanisms were done from ancient times when philosophers took thought concerning relation between colour and light, process of seeing and eye structure. Thus, studies related to the process of seeing and its specific feature—colour visions were done even in antiquity. After I. Newton who was the first in the science to define the physical theory of colour and try to explain the process of colour perception by the sense organs, many scientists were excited by the problem of colour vision, however, its solution was hidden from researchers during many centuries due to some certain reasons, and as it was noted by the scientists (Izmailov 1989; Sokolov 1979), it occurred because processes in mind were considered similarly to the physical ones, i.e. they tried to explain psychological laws analogous to physical ones (Izmailov 1989).

Despite centuries-long studies in the sphere of colour phenomenon, multiple aspects of the problem inevitably led to the necessity of its research from different sides causing appearance of color spectrum physics, physiology of visual and colour perception, colour perception psychology at the initial stage and colorimetrics, typography, chemistry of coloring materials and others.

But up to date among scientists this problem is unsolved because variety of viewpoints on issue understanding has led as well to disagreement related to nature of colour phenomenon. Issue regarding pertinence of a "mechanical approach" came to all spheres of phenomenon study and since I. Newton's ideas determining in theories while colour problem review, becomes more and more critical. An issue related to its replacement with a more efficient dialectical approach is raised in increasing frequency.

2 Materials and Method

An issue regarding necessity of colour phenomenon study was originally found in writings of antique scientists. Since the issue is originated in Empedocles' related to myths writings, in which Empedocles tried to comprehend physics of the phenomenon, so the materials for such study were Empedocles' tractates (430 BC) translated by Losev 2000a, b; Yakubanis 1994) and remained writings belonging to followers of the ancient thinker such as Epicurus (269 BC) and Titus Lucretius Carus (55 BC) translated by F. Petrovsky. Writings of Plato (348 BC) and Aristotle (322 BC) translated by V. Solovyev have been analyzed in order to reveal the quintessence of knowledge regarding colour phenomenon which was accumulated by the antique philosophers. Translated writings of Augustine of Hippo (401), R. Bacon (1255) and N. Cusanus (1440) have been used as materials for study of viewpoint evolution with regard to the concerned problem in the Middle Ages. Viewpoints concerning colour in the Renaissance have been studied mostly on the basis of works belonging to European artists of that time. Scientific period in the history of the issue is covered with the results of the writings belonging to I. Newton (1704), T. Young (1801), E. Hering (1875), Maxwell (1801), W. Ostwald (1923).

Application of historical and comparative method in this study is caused by the tasks related to investigation of viewpoints concerning colour phenomenon on all stages of human cognition in order to: (a) define origins of such viewpoints on the problem; (b) reveal ontological reasons in their subsequent evolution; (c) trace shift of emphasis in colour understanding and initial theoretical hypotheses determined generation and further development of colour phenomenon study in various spheres, such as philosophy, physics, physiology, and etc.; (d) make an effort to uncover reasons of the current state of the issue related to colour phenomenon nature using a retrospective analysis of ideas evolution.

Theoretical and applied questions on the problem studied in this article are disclosed in the works of Choudhury (2014), Kravkov (1951), Ley (1962), Medvedev (2005), Shiffman (2003) and Shishkov (2012).

3 Results

Studies of tractates remained up to now demonstrated that as early as VI century B.C. most of Greek philosophers held a viewpoint that human eyes release invisible emissions which "touch" the subject as though and form visual sensation. For example, visual mechanism as per Empedocles' viewpoint consisted of two basic processes: body penetration by emissions from external subjects, which are signalized by senses, and emissions coming directly from eyes.

Physiological part of seeing process was interpreted by means of mythological world perception. Such physiological part was a single process of mutual activity of four basic elements: fire, water, earth and sky, from the viewpoint of antique thinkers.

Physical aspect of colour phenomenon was explained by means of mythological ideas as well: "colours are brought to vision organs by emissions", "colour is something fitting vision pores" (Yakubanis 1994).

Basic colours classification depended on mythological ideas of antique scientists as well. For example, color range consisted of four colours of primary elements. Such four-colour classification was probably the first attempt of its creation in the history of colour phenomenon study. In accordance with the results of remained antique texts studies it can be stated that notwithstanding that antique thinkers did not specify certain colours, however, the classification included such colours as yellow–brown or ochreous (colour of earth), colour of air was presumably expressed by means of red colour (Losev 2000b).

Described above theory of antique scientists existed for extremely long time and it had reminiscence up to XVII century, however, it had some opponents. Democritus (370 BC) categorically denied existence of eye emissions. The thinker was a follower of a theory stating that visual sensations are the result of influence of small atoms emitted by a luminous body on surface of a human eye.

It is important to consider viewpoint of the philosopher on colour phenomenon. Democritus believed that nature has no colour. The philosopher supposed that colour

is not inherent to bodies and it exists according to a human belief and convention, and it exists only in the sphere of sensation.

It can be found in invaluable for science Democritus' texts studies provided by A.F. Losev that Democritus divided all colours into simple colours and others. He defined four basic colours as simple colours: white, black, red and yellow-green (Losev 2000b).

The further evolution of Empedocles' theory can be traced in the writings of Plato. He believed that all subjects emit a special fluid, which contacts with light poured out through eyes in a form of even and dense flow (Terra—Bookish Club 2009).

Attempts of Plato to explain colours generation mechanism are little in amount and spontaneous, but he was one of few antique philosophers suggested a hypothesis for different colours generation mechanism. For example, in the thinker's opinion bodies emit particles of various sizes. Big particles compress a beam and smaller ones expand that was the way Plato explained "white" which expands a beam and "black" which narrows it. Strong and impulsive fire goes with force through eyes whereby causing tears and mixing of internal and external fires, creating various colours (Terra—Bookish Club 2009).

At that stage due attention was not paid to the issue of colour phenomenon physics, only simple colour classifications were created based on four primary elements, that is why Plato's contribution to colour phenomenon cognition is undisputable since the thinker was among the first in his attempt to provide a detailed description of colour physics.

Aristotle contested some issues of this Empedocles' theory and demanded a clear answer from its defenders: If emissions provide vision, so why don't we see in darkness?

In the work "On the Soul" the philosopher discourses that object of vision is a subject and it determines colour and everything visible. "Colour is on surface of the things that are visible in their own" (Piter 2002). Invisible or "transparent" plays a significant role for understanding of colour essence. Transparency is a feature of all bodies, which differs only in degree of its presence in the bodies. In order to assess level of transparency Aristotle introduced a term "limit" of transparency and this limit is colour itself in accordance with Aristotle's idea. Thus, colour of the body depends on the limit of transparency.

From the thinker's point of view, essence of colour is to be "a driver for medium" (Piter 2002), which puts transparent medium in motion and a sensing organ, begins moving as the result of such continuous influence. Medium affects the visual organ by means of a contract. Generation of colours is done in the result of white colour mixing with darkness in various proportions according to thinker's opinion.

Aristotle divides all colours into simple and mixed ones. The first variant of such division is to divide colours into white, black, and yellow in accordance with their dependence on elements. The second variant of colour division is to divide colours into white and black. Other colours are done by means of mixing as per Aristotle's theory.

An attempt of the ancient thinker to find regularities in the sphere of sense perception resulted in quintessence of metaphysical paradigm of colour phenomenon in antiquity.

Further discovering of interrelated activity of eyes and brain allowed medieval scientists and religious personages to use knowledge about visual mechanism not only for explanation of corporal vision but and for spiritual one, because a body is a soul's tool for cognition of the world and vision shall perform this function.

Following antique scientists' ideas, the thinkers believed that presence of primary element of fire in an organ of vision provides possibility of seeing process in the course of which the organ of vision perceives light, shadow and colour and perception of the later occurs because beams of visual light from eyes reach external objects and "touch" them determinating their optical and geometrical properties and then using light aterial transmit received information to the organ of vision. The theory acquired a hypothesis that vision begins with will guiding cognitive ability (visual beam) to a subject, which imprints on it its shape therefore informing it.

Medieval scientists polemized actively whether colour nature is accidental or substantial. For example, Arabic scientist Avicenna (1037) stated that colour is something potentially perceptible and Johannes Peckham (1292) taught that colour should be considered as light uncovered in colour (Kuehni and Schwarz 2008). Both Thomas Aquinas (1274) and Bonaventure (1274) understood colour nature not as a corporal substance but as accidental form of the body.

Arabic scientist Averroes (1198) believed that colour has its own source in aterial, which is characterized by emission of all colours. This feature like others is an accidental manifestation of aterial. Notion of colour perception is preceded by subject condition. Colour "exists in itself" (Sokolov 1979). Relation arises between senses and colour existing in aterial. Colour causes visual perception in such relation. Senses can reflect colour only if there is there is a coloured subject. Colour shall exist materially in order to be perceived by senses.

Bacon (1255) also shared popular viewpoint on visual mechanism. In his opinion generation of a visual image is formed in a sensitive soul. And its abilities include imagination, preservation of species, i.e. an action (imprint) of species from the observed object that eventually generates a complete visual or verbal image (Bacon 2005).

The scientist defined eight conditions required for execution of seeing process among which light is the first one since it is the first visible, then the next visible after light is colour in his opinion. The scientist believed that colours of world objects are embodiment of light.

In our opinion Rene Descartes (1637) was close in his suppositions to the modern science with regard to the issue of colour perception. In his reasoning he also used the newest information of the epoch related to eye structure and stated that colour is a sort of movement occurred in the brain particles to which optical nerves are connected resulting in generation of colour sensation in the same way as strength of such movement induced light sensation in the soul. And dissimilarity of this movement explains variety of colours from the viewpoint of the philosopher.

The next colour phenomenon cognitive stage was in the Renaissance. Notwithstanding that contribution to colour nature cognition was small enough, however, it is possible to say that the Renaissance is characterized by appearance of a new colour classification principle based mostly on the practice of painting but not on mythological world views or religious behests. Thus, colour theory appears in Europe as separate field of science and colour systems are invented in form of circles, scales, tables, and triangles to be used by artists.

For example, Leonardo da Vinci (1519) defines six basic colours (on the basis of principles of painting), names of artist's palette paints corresponding (in his opinion) to basic colours existing in nature. Thus, from the viewpoint of the scientist white denoted light, yellow—earth, green—water, blue—air, red corresponded to fire, and black was colour of night and darkness. It should be noted that determination of basic colour in the palette was still affected by religious views of the artist.

As it is evident from the classification Leonardo da Vinci believed that white is not a colour but it can absorb any of colours whereby anticipating famous discovery done by Newton. "We can say that surfaces of illuminated bodies almost never have their real colour… If you take a white stripe, put it in a dark place and direct light on it from three slots, i.e. from the Sun, from fire and from air, so such strip will be three-coloured" (Volkov 1965).

Alongside with Leonardo da Vinci's classification there were classifications based on world views of antique philosophers. For example, Leon Battista Alberti (1335) proposed a colour classification duplicating Empedocles' system and believing that there are only four real colours corresponding to primary elements and the whole infinite variety of colours is done by their mixing and variation of light and darkness degree.

The Italian philosophers Marsillio Ficino (1489) and Franciscus Patricius (1579) turning back Plato's ideas believed that many colour ideas reveal in light since colour is present in objects. They proposed a classification based on the principle of ideas emersion level increase. For example, in their opinion idea of black colour reveals in the lowest degree, then goes idea of brown, dark yellow, dark blue and green, the fifth are ideas of sky-blue and sea-green, the sixth is warm red, the seventh is light red, the eighth is saffron yellow, the ninth is white, the tenth is transparent, the eleventh is glittering, sparkling and finally the twelfth idea revealing itself in the most degree is the idea of shining.

The twelve-season color theory was also held by the Italian poet and playwright Antonio Telesio (1528). Besides unusual arrangement of colours, emphasis in its classification was put on natural colours and absence of yellow colour.

Physicist and mathematician Girolamo Cardano (1545) created a seven-stage colour scale consisting of white, yellow, red, green, wine colour, dark blue and black colours. He proposed that each colour in the classification contains certain amount of light to which he assigned a numerical value.

Johannes Zahn (1685), Robert Boyle (1670), Francois d'Aguilon (1617), Francis Glisson (1664) and others depicted colours in a form of a triangular. Six-stage colour circles were proposed by Yohann Wolfgang von Goethe (1810) and Schopenhauer (1816). German artist Phillip Otto Runge (1810) created a colour-sphere, which

represented classes of pigment colours. The following scientists made their contribution into creation of a colour scale: SigfridForsius (1624), Robert Fludd (1637), Athanasius Kircher (1646), and Elias Brenner (1691).

In 1665 N made a conclusion that colours are not variations of light obtained in the process of deflection or reflection from natural bodies but the original inherent feature of light. He made a conclusion that colour is a substance. White colour is a combination of simple colours included in the spectrum. The scientist classifies seven basic colours as simple colours: red, orange, yellow, green, blue, dark blue and purple and says about light refraction (dispersion) which is the main reason for spectrum appearance in his opinion. And a seven-stage colour circle appeared after bending of spectrum in the form of a ring.

This colour theory was brand new for science and explaining many aspects of colour nature. The scientist implements methods of mathematical description and methods of quantitative measurement in his studies. It is possible to say that it was the beginning of a scientific period in colour phenomenon cognition.

In despite of breakthrough in understanding of colour nature, there were critics of Newton's colour theory. For example, Goethe (1810) proved invalidity of this theory by the fact that none of artists could get white colour by mixing paints of different colours. He was totally against study of colour phenomenon by means of mathematical methods and believed that the only natural light was white which was an individual entity in his opinion.

The scientist developed his own classification of colours based on artist's palette colours. He believed that the main elements required for emersion of colours are light and darkness or light and non-light. In addition to the above the scientist thought that any colour should be considered as half-light or half-shadow. He explained that yellow colour appears near light but blue colour appears near darkness. Mixture of these two colours, i.e. of light and darkness, gives green colour. Thus, the scientist provides detailed description of colours generation by mixing light and darkness or half-light and half-shadow, explaining the role of white and black colours: because, in his opinion, black colour leaves a visual organ in profound rest, but white, on the contrary, makes it work putting in motion by its own action.

Studying the colour phenomenon issue, Goethe proposed a classification in which all colours were divided into physiological, physical, and chemical ones. The first of them are colours based on action and reaction of an eye and they were considered by him as transient. The second ones are physical colours, i.e. colours being revealed in colorless media in other words inherent to subjects. Such colours are acquired and temporary attached ones from his viewpoint. And the third colours are chemical ones being the most lasting colours. In this regard the author of the classification pointed at interrelation between these three types. To our opinion this Goethe's theory distinctively contains key aspects of Aristotle's philosophy.

In the middle of XIX century James Maxwell proved that light is electromagnetic oscillations, i.e. periodical changes of electrical and magnetic fields in space. This electromagnetic energy has active influence on light sensitive elements of an eye as a result of which light and colour sensations are formed. In particular wave length

within 380–770 nm affecting an eye induces light sensations in the organ of vision. A certain colour corresponds to each length of visible light waves.

Further indisputable contribution to the study of colour phenomenon was done by Hermann von Helmholtz (1866), Thomas Young (1801), and Ewald Hering (1875) who significantly clarified generation of colour sensations and perception through detailed investigation of colour phenomenon physiology aspect. Their theories were based on two-stage theory of seeing process, which is used by the modern science till now.

XX century was marked by creation of scientific works in the sphere of colour quantitative assessment and measurement. Colours are systematized in the works of such scientists as Wilhelm Ostwald (1923), Munsell (1929). Beginning with the middle of XX century there was a significant increase in the number of studies in applied sciences. Thus, colour phenomenon being originally an object of study for physics, optics, physiological optics and eye anatomy flew into such applied disciplines as colorimetrics, lighting engineering, photography, colour reproduction equipment, typography, television, color chemistry, and etc.

Human sciences also could not pass by the study of colour phenomenon because colour vision is a human ability, its peculiarity that differs human from animal. Colour became an object of study for linguistics (Wierzbicka (1996), Berlin and Kay (1969) and others), psycholinguistics (Frumkina 1984), cultural studies (Serov 2004), semiotics (Bart (1967) and others), and psychology (Nemov (1977), Yanshin (2006) and others) and of many other applied sciences.

Interdisciplinarity of the problem become apparent in study and comparison of semantic meanings, symbolic, emotional, and sign-oriented nature of colour that significantly reconcile many sciences, such as for instance, cultural studies with linguistics and semiotics, psychology, architecture, design, literature and poetry and many other disciplines.

Modern scientists perform active studies in the sphere of ethnocultural processes, where the significant role is played by ontological phenomena such as colour phenomenon. Akhmetova fairly notes that relevance of such studies "is determined by challenges posed by the modern international situation" (Akhmetova and Bobyshev 2015).

Cultural cooperation is very important at the international political arena since it is "an important tool of internal and external policy means for resolution of ethnic conflicts" (Akhmetova and Bobyshev 2015).

4 Conclusion

Colour phenomenon is an ontological phenomenon since humanity lives in the world of colours beginning with its appearance and till now. No wonder that works of antique philosophers contain first attempts to lay the basis for understanding of this problem, process of seeing and colour vision mechanism.

No doubts that study of colour phenomenon was hindered by some factors being natural for evolution: base of antique knowledge did not have enough information regarding light phenomenon, eye structure, and visual mechanism which could help philosophers to gain an insight into colour phenomenon. And that is why due to the absence of tools for study of various natural phenomena ancient had to base themselves on subjective sensations during cognition of the world. However, even in the works of antique philosophers there were first obvious attempts to differentiate physics, physiology, and psychology when describing colour phenomenon.

Mythological systems were replaced by religions with the advent of the Middle Ages. Colour phenomenon became a tool of vergers as an evidence of metaphysical and celestial light embodied in nature. As the result of the fact that in the Middle Ages deity was identified with light, the basic colours included the maximum lightful colours.

Medieval scientists and antique philosophers still could not get reliable information regarding colour phenomenon due to the absence of proper tools. However, their merit can be accumulation and saving of hypothesis and theories provided by antique philosophers that subsequently facilitated to emersion of right viewpoints on colour phenomenon understanding laying the foundation for creation of optical instruments served later for obtaining of reliable information concerning nature of colour.

Colour systems provided by the Renaissance artists and scientists played an important role in evolution of colour phenomenon understanding and were further developed in XVIII, XIX and XX centuries laying the foundation for study of colour phenomenon from the point of view of psychophysiology, colorimetrics, and etc.

Step-by-step accumulation of empirical and theoretical data concerning visual perception mechanism and more detailed information on visual organ structure brought nationalists closer to the scientific period of problem understanding with each subsequent epoch.

Newton's colour theory was a breakthrough in scientific knowledge. It undoubtedly enriched science with information concerning physical nature of colour, which up to now has strong influence on colour phenomenon understanding including physiology and psychology of colour perception. Discovery done by I. Newton allowed G. Helmholtz, T. Young and E. Hering to clarify generation of colour sensations and perception, suggest a two-stage theory of colour perception physiology, which is deemed now as authoritative one in scientific community.

"Multidisciplinary nature" of colour was the reason of colour transition as an object of study from physics to many disciplines and sciences being applied to them. Notwithstanding that the problem was initially raised in Antiquity, hundreds and thousands of years passed, colour problem is raised and analyzed in the most of sciences, however, scientists still have no single viewpoint on colour vision mechanisms, colour nature and the fact of its existence. Question, "What is colour and where does it exist in the world around a human being or is it a product of a human mind?" is still open and the answer to be found.

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Transmitting Culturally Significant Meanings Through Art (Exemplified by International Art Project)

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Abstract The purpose of this study is to identify culturally significant meanings and outline the features of their transmission through art exemplified by an international art project. The object of the research is focused on culturally significant meanings; the subject of the research is the transmission of culturally significant meanings, considered on the example of an international art project. For the purpose of the study, several methods and approaches were used: a generalization of the available theoretical data on culturally significant meanings and their transmitting, and also on art as a communication channel in culture; description of the international art project, the materials of which are selected as the empirical basis of the study; identification and interpretation of key concepts expressed both visually in the art works and verbally in the texts of descriptions of artworks. It is shown that through the works of art in an art project, the transmission of culturally significant meanings takes place. Successful transmission of meanings and their successful perception by the recipients are noted. The specific feature of transmitting cultural meanings in the project under study is a combination of visual means and a verbal description of the ideas of the paintings in the author's essays that accompany the paintings, which contributes to their adequate understanding. A cultural study of the existing art project, which is still in the process of development, was undertaken from the point of view of interpretation of culturally significant meanings transmission through works of art.

Keywords Cultural meanings · Culturally significant meanings · Meaning transmission · Culture · International art project

JEL Codes M13 · L31 · O15 · O19 · Z10 · Z11 · Z19

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1 Introduction

Modern society is characterized by a high level of information saturation and a wide variety of communication channels. A person is constantly in the process of conscious or unconscious perceiving of the meanings that the flow of information throws upon him. In this view, the meanings can be of a different nature, of different qualities: significant and non-essential, important and secondary, etc. In the information era, special attention should be given to the understanding of how and in what ways the transmission of cultural meanings takes place in a society, in particular, the features of the transmission of culturally significant meanings as the most important for an individual and a society as a whole. Art, both historically and in the information age, continues to be one of the means of communication, playing a significant role in the transfer of culturally significant meanings. Therefore, the solution to the problem of identifying the features of the transmission of culturally significant meanings through art in the human environment is important for modern science and practice, thus determining the relevance of the study.

The complexity of solving this problem is caused by the fact that the very concept of cultural meanings and culturally significant meanings is rather abstract. Nevertheless, we consider it important to undertake both the theoretical research of this concept as one of the most essential in cultural science, and the practical study of the transmission of culturally significant meanings using specific examples. This will help to contribute to a deeper understanding of such a phenomenon as the meanings of culture, culturally significant meanings, as well as the features of their transmission in a society through art, which can help improve the existing and search for new human opportunities in this area.

2 Materials and Method

Issues related to the definition and interpretations of various aspects associated with the meanings of culture, socially and culturally significant meanings, were developed in the fundamental works and special studies () and other researchers.

At the same time, despite the fact that the problem is developed at the theoretical level, the problem of the features of culturally significant meanings transmission through art has not been adequately studied at the empirical level on the basis of specific facts of culture. This study is intended to fill this gap by demonstrating how the transmission of culturally significant meanings through visual art takes place as exemplified by a modern art project.

The research material was represented by theoretical scientific literature on various aspects of the issue under study, as well as empirical material related to the international art project “Angels of Peace”. The latter should be described in more detail. The empirical material of the study is represented by images of paintings made by the project participants in a visual (non-verbal) form, containing and conveying the

meanings of interest for the study, as well as texts describing the ideas and concepts of the paintings created as part of the international art project "Angels of Peace". We proceed from the fact that these texts contain meanings that are significant for their authors and are being transmitted to the general public. The empirical material includes 289 images of paintings painted by 289 authors from 25 countries (Armenia, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, England, Finland, France, Greece, India, Italy, Kazakhstan, Macedonia, Russia, Singapore, Slovenia, Spain, Turkey, Ukraine, USA, Uzbekistan). The empirical material of the study also includes documents related to the project, programs, audience reviews, and project souvenirs—materials that are publically available on the official website of the "Angels of Peace" project at http://www.365angels.com/ on open access.

This study aims at researching the culturally significant meanings and features of their transmission through art studied on the example of an international art project. The object of the research is culturally significant meanings; the subject of the research is the transmission of culturally significant meanings, considered on the example of the international art project "Angels of Peace". To achieve the goal, the following research tasks were set: (1) a brief theoretical generalization of the concepts of culturally significant meanings and transmission of meaning; (2) a brief description of the international art project "Angels of Peace" in order to illustrate the issue under study; (3) the identification of culturally significant meanings in the empirical material of the study; (4) the interpretation of the features of the transmission of culturally significant meanings through art, that can be found in the course of studying the materials of the international art project "Angels of Peace".

The following methods and approaches were used to fulfill the objectives: (1) brief review and generalization of the available theoretical data on culturally significant meanings, their transmission, and also on art as a communication channel in culture; (2) a brief description of the international art project, the materials of which are selected as the empirical basis of the study; (3) the identification and interpretation of key concepts expressed both in the texts of descriptions of works of fine art (verbally) and visually in the works themselves; (4) the systematization of facts revealed by targeted observation of culturally significant meanings transmitted in the framework of the studied project. In general, we proceed from a semiotic and structural understanding of cultural artifacts as texts containing meaning that is subject to observation, identification, description, and structural analysis.

3 Results

Modern cultural studies define cultural meanings as "ideational constructs associated with cultural objects as signs, that is, their informational, expressive content (meaning)" (Likhvar et al. 2010). This means that all cultural objects contain certain meaning. Cultural meanings are also defined as information generated by historical experience and serving to develop a way of being, culture, lifestyle, understanding

the world and its purpose in it (Likhvar et al. 2010). Such an approach to the study of the meaning and significance of cultural forms exists within the framework of cultural semantics or cultural studies of semantic forms (Lotman 2010). As A. Fliyer notes, "from this perspective, any cultural phenomenon or event can be read as a text that carries certain socially significant meanings" (Fliyer 2010). Socially significant meanings—this is the information that is significant for a particular society. Similarly, culturally significant meanings are the information that is significant for a particular culture (in this case, in the sense of a group of people united by belonging to a particular culture). With this approach, the concepts of "socially significant meanings" and "culturally significant meanings" can be used as synonymous, with only a slight discrepancy. In the framework of this study, we use the concepts of cultural meanings, culturally significant meanings and socially significant meanings as synonymous, since some differences between them are not essential for the purposes of this study.

One of the important properties of information that we can observe in the current information age is its ability to disseminate, transmit, broadcast (we use these terms as synonyms in the framework of this study). Thus, the meaning as the content of information can also be transmitted or broadcast from the source of information to the recipients, from the author(s) to the recipient(s). There are many ways and channels of transmitting information (and, accordingly, the meanings contained in it).They are studied by the theory of information, and in the sociocultural aspect,—by various social and humanitarian disciplines (such as sociology, cultural studies, philology, etc.). In the information age, new channels of information transmitting, such as the Internet, deserve a detailed and in-depth study. However, some channels of information transmission which were relevant throughout history and in the periods preceding the current information era remain relevant today. The study of their functioning in terms of cultural meanings transmission in the modern information age is of interest, because it helps to comprehend the universal essence of these channels. We are talking about art as an artistic activity and its results, as one of the forms of public consciousness and one of the channels for transmitting culturally significant meanings. According to the ideas of modern cultural semiotics, "meanings act as existential constants of the world, due to which they become the basis of specific acts of world relations, including in specialized forms of cultural activity—art, religion, philosophy, science, etc." (Likhvar et al. 2010). In this study, works of art and related materials (for example, authors' essays that reveal the ideas of paintings) are considered as meaningful texts (both verbal and nonverbal), that is, texts that transmit culturally significant meanings.

To study the problem of the features of the transmission of culturally significant meanings through art, the materials of the international art project "Angels of Peace" were selected. The choice of this particular project is determined by the wide international coverage of the project (authors represent 25 countries of the world), active exhibition activities (more than 230 exhibitions and presentations of the project in Russia and other countries over 5 years) and a wide audience reach (more than 295,000 visitors to project events according to figures for the year 2019). The key tasks of the project, as formulated by the organizers on the project's official website,

attract the attention of the cultural researcher: "creating a unique art object "The Calendar of the Angels of Peace" and a permanent museum for this project, cultural exchange, acquaintance of a foreign audience with Russian artists and their works (because most of the exposition will contain paintings by artists from different cities of Russia), as well as a peacekeeping mission of art, and cooperation with charitable organizations (International Art-Project "Angels of Peace" 2020). The idea of the project is to create an international exhibition of 365 paintings (by the number of days in a year) dedicated to the image of the Guardian Angel, which has the same format 1 × 1 m. As of April 2020, the project has not yet been completed, it continues to complete and collect paintings, as well as continues its artistic and educational activities, that is, is in the process of development. Nevertheless, the significant results achieved so far, reflected in detail on the official website of the project on the Internet, provide sufficient material for the study.

Culturally significant meanings transmitted through the project are primarily formulated by the project organizers: love, inspiration, gratitude, unity, safeguarding of peace on earth, spiritual and physical recovery. The latter is related to the background of the project. The idea of the project belongs to the artist Julia Ivanova, who was able to defeat the disease, in her opinion, with the help of art classes (daily drawing of angels). This served as an inspiration for the artist and led to the idea that the practice of drawing and contemplating angels can contribute to positive emotions, thoughts, and impressions, leading to positive changes in human life.

All pictures of the project in one way or another reflect the theme of the project. As the authors of the project note, "Angels of Peace" show a large palette of images and readings of an angelic theme" (International Art-Project "Angels of Peace" 2020), and this is certainly true. Without undertaking a detailed art criticism analysis of the artistic images and techniques for performing the paintings of the project, since this is beyond the scope of this study, we noted that the works were written by professional artists and amateurs alike, and represented a wide variety of interpretations of the theme of angels. Most of the works of the project contain in one form or another the image of an angel as a humanoid creature with wings. But there are also works in which the angel is present implicitly, and the picture shows only the text of the prayer (the painting "Prayer" by V. Slonov), an abstract image (the paintings "Meeting with the Angel" by I. Klimenko, "Birthday of the Soul" by E. Zhukovskaya), a child opening its arms (the painting "The Joy of My Angel" by M. Shveikina), symbolic images of crosses and the globe (the painting "Three Crosses" by V. Zopf), hands holding two people under an umbrella (painting "Mother's Hands" E. Khusainova), etc. In this case, the absence of an image of an angel can be considered as a "zero sign" in the interpretation of A. Shuneiko and O. Chibisova, who note that "interpretation of a zero sign implies knowledge of the system, its adequate reading, the perception of the context and the mandatory presence of cultural memory" (Shuneyko and Chibisova 2017). Indeed, the images in the paintings indirectly relate the viewer to the theme of angels through religious images of prayer and the cross, as well as universal images of love and care, expressed as embraces, an umbrella that protects people from weather, etc. All these images contain meanings associated with the idea guardian angel: "love", "care", "protection", "hope", etc.

Most paintings of the project are accompanied by short author essays that reveal the concept, history of creation or the artist's ideas in connection with the theme of the work. The texts of these essays provide the researcher with rich verbalized material that complements visual images. Based on the study of the essay texts, one can identify the most common ideas that artists, according to them, embodied into their paintings. Such ideas include "love", "good", "peace", "hope", "happiness". For example, E. Isayeva in her essay accompanying the picture "Don't Let Go!" notes that she portrayed an angel holding the planet Earth with a thread and protecting it and all its inhabitants. "And a little angel can get strength for this from the same Earth, but only while there are Love and Good on the Earth" (International Art-Project "Angels of Peace" 2020), writes E. Isayeva in her essay. Here, the author directly names those meanings that she considers fundamental to humanity ("love", "good"), and embodies them in her art work.

The painting "February" by M. Tyunyayeva depicts an angel selflessly playing the cello. In an accompanying essay, the author writes that she connects the image of a musician angel with the transition from one state of nature to another, from cold winter to spring warmth. "This picture is about Hope. The fact that winter is not eternal, even if it seems that it is. The angel has already taken his bow!" (International Art-Project "Angels of Peace" 2020), the author concludes, also directly naming the meaning that is embodied in her work ("hope").

The painting by V. Tokarev "Bright Angel Casting out Darkness" depicts a mother in the form of an angel clutching a baby. The picture is not accompanied by an author's essay, but even without a verbal text, the viewer understands the meaning embodied in the work by the author: for each child, the mother is its bright guardian angel, expelling darkness, which is, protecting it from all dangers and misfortunes. The main meaning embodied in the work is "motherly love".

We find a kind of generalization of the culturally significant meanings of the project in the author's essay by T. Krivo, the author of the painting "Blagovest" (or "Ringing of Church Bells"), in which she writes: "Through fine art, the artist < … > has the opportunity to share a particle of his soul and his worldview with people around him. The image of an angel means Soul, Light, Good, Faith, Hope and Love, which every person in the world needs" (International Art-Project "Angels of Peace" 2020).

The scope of the scientific article does not allow us to give all examples of the embodiment of the meanings realized in the paintings of the project, however, it can be seen from the above examples that the authors creating their works put various meanings united by the theme "Angels of peace" into them. The fact that these meanings reflect universal and essential ideas for a person, allows us to find out culturally significant meanings, first of all, significant for authors of paintings as subjects of culture. These meanings can be significant for the recipients, the viewers of the project, too, and this fact will be evidenced by the presence of a positive response from the audience. If the meaning put by the author of the work finds a positive response in the soul of the viewer, it means that it is understood and interpreted by the recipient from the same or similar positions as the author's.

Indeed, in the book of reviews of the exhibition of the project "Angels of Peace", which was held in Komsomolsk-on-Amure from June, 28 to September, 15 in 2019, all reviews are positive. We give the examples of some of them. "The unrealistic energy of light, goodness and joy. We left inspired!" (E. Salinova), "The exhibition "Angels of Peace" inspires. May peace be preserved!" (N. Kozlova and I. Antonyuk), "A very bright, gracious exhibition. The soul is filled with lightness and peace. Wings of inspiration grow, and I want to give love and peace"(Olga V.), "We leave winged, with warmth in our souls and a desire to do something good"(O. Terezanova). In addition, the presence of a large number of positive reviews about the paintings of the "Angels of Peace" project from the cities where the project exhibitions were held (St. Petersburg, Prague, Krasnoyarsk, Yeniseisk, Kemerovo), published on the project's official website on the Internet, indicates that the meanings transmitted by the art works and significant for the authors of the paintings are also significant for the audience of the project, who leave their positive feedback.

The presence of feedback in the form of reviews is evidence of the establishment of a certain kind of communication between the authors and viewers of the project, the exchange of information about the artistic understanding of the world. The meanings that are significant for the authors of paintings are embodied in works of art and transmitted to the recipients (viewers) during the demonstration of the works, either directly in the exhibition halls of museums and galleries, or indirectly on the official website on the Internet or on souvenir products of the project (which include postcards, magnets, and other souvenirs). That is, the project organizers use various communication channels, both traditional (exhibition halls) and innovative (Internet, photo prints on various objects), which allows them to expand the audience of the project.

4 Conclusion

Based on the foregoing, it can be concluded that art remains an effective channel for transmitting culturally significant meanings, even in a modern information or digital society. The problem of studying culturally significant meanings transmission through art at present consists in a high degree of abstractness and ambiguity of the theoretical concepts "meaning", "cultural meaning" themselves, as well as in the absence of a unified approach or an algorithm in the study of the processes of transmitting significant meanings in modern cultural space.

The innovative solution to this problem may consist in using a combination of elements of the semiotic and structural–functional approaches to identifying and analyzing culturally significant meanings in works of art and the characteristics of their transmission to recipients (in this case, to the general public), as shown in this study on the example of international art project. The study showed that through the works of fine art in the framework of the international art project "Angels of Peace", culturally significant meanings such as "love", "good", "hope", "happiness", "protection" are transmitted. Positive feedback from the audience of the project testifies

to the successful transmission of meanings and perception by their recipients. A specific feature of the transmission of cultural meanings in the studied project is a combination of visual (pictorial) means and a verbal description of the ideas of the paintings in the author's essays that accompany the paintings, which contributes to their adequate understanding and interpretation from positions close to the author's. In addition, for the transmission of culturally significant meanings, the project uses both direct contact of works with the audience (in exhibition halls), and mediated contact via the Internet using souvenir products of the project. In general, a study of the project materials indicates that art is an effective channel for transmitting culturally significant meanings in the modern world, and further in-depth study of communication mechanisms through art can contribute to understanding and improving the processes of transmitting culturally significant information at the present and future stages of society development.

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Comparative Analysis of Coats of Arms of Irkutsk Viceroyalty from the Drawing from the Collection of Baron G. F. Asch and the Original Drawings from the Decrees of Catherine II in 1777 and 1790

Andrei A. Aksenov

Abstract Based on a comparative analysis of the drawing with the images of coats of arms, originating from the collection of Baron G. F. Asch, the author determines the possibility of dating this sheet. Additionally, the author establishes the primary or secondary nature of the image in relation to the approved coats of arms of 1777 and 1790. The author considers the possibility of creating a drawing of coats of arms only according to the descriptions of the approved coats of arms of 1790 and finds the correlation of the images of the coat of arms in the drawing and the approved coats of arms of 1790. The methodological basis of this research includes the analytical method, comparative analysis, and systemic and structural–functional research methods. Based on the analysis of the material, the author makes several conclusions. First, even though the drawing comes from the collection of Baron G. F. Asch, its author remains unknown. Second, the drawing was created later than 1777 (this is a conclusion derived from the logic of reasoning) but before May 22, 1794. Third, given the first approval of city coats of arms in the new two-part system on May 29, 1779, the drawing was created later than that date. The author reveals the impossibility of the fact that the coat of arms in the drawing was created according to the descriptions of the Decree of 1790. The drawing was probably created before the approval of the coats of arms of the Irkutsk Viceroyalty in 1790 (this non-obvious conclusion stems from the logic of the analysis of approved coats of arms and coats of arms in the drawing). Finally, the author concludes that the coat of arms in the drawing has a close relationship with the approved coats of arms, which allows us to consider the drawing and coats of arms of 1790 as a single complex. The sheet of drawings from the collection of Baron G. F. Asch differs from the coat of arms of the Irkutsk Viceroyalty confirmed in 1790, which is currently a promising working hypothesis.

Keywords Coat of arms · Heraldry · Irkutsk viceroyalty · Babr · Beaver · Baron asch

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1 Introduction

The paper analyzes the sheet with the images of coats of arms originating from the collection of Baron Grigory Fedorovich Asch (Thomas Georg von Asch). This paper is one of the parts of the general research on the problem of coats of arms of the Irkutsk Viceroyalty of the time of Catherine II.

The problem of the Irkutsk coat of arms concerns the interpretation of the beast on the viceroy's coat of arms itself and at the top of all coats of arms of the cities in the Irkutsk Viceroyalty, which, in domestic heraldry, can be designated under the general name of *the science on panthers*, *babrs*, *tigers*, *and beavers* (babr is the old Russian word for panther, etymologically descended from the Yakut language; now obsolete). Despite several publications, this problem remains open and still requires additional sources to give a definitive answer and an unambiguous interpretation of these coat-of-arms (Emelin 2017, 2019; Gaselnik 2015, 2016; Korolev 2005; Kurennaya 2012). Nevertheless, based on the analysis of already known sources and the involvement of new archival materials, one can conclude certain fundamental aspects of the creation and transformation of these coats of arms.

One of the most essential and very peculiar sources on the heraldry of the Irkutsk Viceroyalty of the eighteenth century is the so-called sheet of drawings from the collection of Baron Asch. It is kept in one of the largest and oldest universities of Lower Saxony—Georg-August-Universität Göttingen. In printed editions, the image of a drawing with the coat of arms from the collection of Baron Asch is given in the work of Gaselnik (Gaselnik 2016). In its complete form, this source may be designated as "A sheet of color drawings of the coats of arms of the Irkutsk Viceroyalty, divided into provinces, originating from the collection of Baron G. F. Asch." For simplicity, in this article, the author will refer to this source as the "sheet of drawings," "drawing," or "drawings of Baron Asch's coat of arms."

Baron G. F. Asch (1729–1807) most likely was not the author of these coats of arms, but only bought this drawing for his collection, along with other drawings, engravings, maps, town plans, and other items later sent or taken to Göttingen. Therefore, we refer to Baron Asch not as the author of this drawing but as the collector and the owner of this image.

The sheet itself has a modern printed label in German. This label indicates the collection of Baron Asch (Asch 288), gives its size—29 cm high and 21.5 wide, and specifies the period—eighteenth century. Moreover, the label contains a text description of the drawing. The drawing does not have a more precise dating. The drawing shows 17 coats of arms divided into four parts according to the identity of the cities of the Irkutsk (4 coats of arms), Nerchinsk (4 coats of arms), Yakutsk (5 coats of arms), and Okhotsk (4 coats of arms) regions. All 17 coats of arms in the drawing are enclosed in one cartouche. The bottom of the sheet has three inscriptions, apparently

made at different times and for different purposes. The first two inscriptions are made in ink and the last one—with a pencil (as far as the copy shows).

The first inscription is located in the lower right corner of the cartouche and represents two Latin letters "Ah" (it actually intrudes into the drawing and is probably a mark of Baron Asch himself or a mark of the seller, who sold the drawing to Baron Asch).

The second inscription is located under the cartouche, at the bottom of the sheet; it says "Wappen von den Provinzen in der Irkutskischen Statthalterschaft. The second inscription is almost identical to the text in the general description of the consignment ("11. Wapen [in the original, the second "p" is missing] von den Provinzen in der Irkutskischen Statthalterschaft. Illuminirt").

The last inscription, "Asch 288," is apparently the latter one. It indicates the inventory number in the collection of Baron Asch (these numbers repeat the number on the label).

The possibility of comparison is based on the proximity of the drawing from the collection of Baron Asch with the official drawings of the approved coats of arms for the city of Irkutsk and the cities of the Irkutsk Viceroyalty in 1777 and 1790. The number and sequence of coat-of-arms drawings also allow talking about the close nature of these sources. I. B. Emelin (Emelin 2019) comes to similar conclusions. Examining the leaf figures and comparing them with the coats of arms originating from the Complete Collection of Laws of the Russian Empire, he notes that "the figures are different, but as if they illustrate the same plot." The researcher draws the logical conclusion that "it is evident that this table is related to the adopted coats of arms of the Irkutsk Viceroyalty; it either freely interpreted them or became the basis for their creation" (Emelin 2019).

Based on the possibilities that this source can give for the perception of the coats of arms of the Irkutsk Viceroyalty in the eighteenth century, we can set the following research tasks:

1. To determine whether the sheet can be dated;
2. To establish the primary or secondary nature of the image in relation to the approved coats of arms of 1777 and 1790;
3. To consider the possibility of creating a drawing of coats of arms based on the descriptions of the approved coats of arms of 1790;
4. To consider the relationship between the coats of arms in the drawing and the coats of arms approved in 1790.

During this research, using the funds of the Russian State Historical Archive (St. Petersburg), the author found and analyzed the original decrees of Catherine II on "Emblems of the cities of Irkutsk Province" (1777) and "Coats of arms of the Senate, with annex to the cities of Irkutsk Province" (1790). This allowed obtaining important information about these coats of arms and replacing the sources for comparative analysis with more important ones (the primary source) (Russian State Historical Archive n.d.).

Thus, the author operates with authentic decrees and conducts a comparative analysis using a broader base of sources. Moreover, the author introduces textual sources and images of coats of arms, most of which are published for the first time.

To provide a better perception and clarity of information, the author combines the analyzed data in a tabular form (Table 1). The first column contains descriptions of coats of arms originating from the original text of the decrees (1777 and 1790), since they describe the official version of the coat of arms and serve as a starting point for comparison.

The second column contains a reconstructed description of the coats of arms from the drawing in the collection of Baron Asch (the drawings themselves are presented without any description). When describing the drawing with the coats of arms, in cases where the descriptions of the coats of arms in the drawing and the approved coats of arms coincided, the author used (where possible) the descriptions of coats of arms in the heraldic tradition. The possible semantics of coats of arms following from the description of the coats of arms in the drawing is not presented since it is not confirmed reliably. If the image of some detail of the coat of arms is not entirely clear, it is indicated in the description or denoted by a question mark in brackets.

The third column includes conclusions and comments. There are revealed differences between the descriptions and drawings of coats of arms in the collection of Baron Asch and the descriptions and drawings of the approved coats of arms of 1790. To save space, the author does not include a summary table of the analysis of these sources with descriptions and drawings of coats of arms, presented in the "Complete Collection of Laws of the Russian Empire" (1830 and 1843), since they are of interest for the general analysis of Irkutsk coats of arms but are not relevant to the analysis of Baron Asch's drawings). The author does not consider the preservation of the images of the drawing in the comments.[1]

2 Materials and Methods

The methodological basis of this research includes several methods—analytical methods, comparative analysis, as well as systemic, structural, and functional research methods (Chebaniuk 2010; Shuneyko and Chibisova 2019).

[1] In a private conversation, I. B. Emelin drew attention to the fact that the upper part of the images from Asch's drawing was subjected to mechanical impact, while the lower part of the drawings has no similar damage. The researcher believes that this damage was caused by an attempt to erase the image of the panther. The author of this research believes that the nature of the damage indicates that the upper part was probably glued, and then the top part was simply ripped off, which led to the loss of part of the pattern. It is possible that it was a paper with the image of another animal (a beaver or a babr). In any case, the digital copy does not allow drawing a conclusion about the nature of the damage (even if it is of good quality).

Table 1 Comparative analysis of the coats of arms from the decrees of 1777 and 1790 and the drawings of the coats of arms from the collection of Baron Asch

Drawing Description from the "Complete Collection of Laws of the Russian Empire"	Baron Asch's drawing Description	Conclusions and comments
On the Aldan River "In the silver field, there is a blue winding band running down the middle, showing the river, by which this government is named and established."	–	–
Ust-Kirensk "In the silver field, three blue stripes join in the middle of the shield, so that from below they compose a rafter; from its edge, one joins on the top of the shield showing the mouth of the Kerensky river at its fall."	–	–
Balagansk "The shield is cut by a horizontal line into two parts. The upper part is golden with the Imperial Eagle extending to the half, topped by two golden crowns on the heads and a third in the middle. The lower part is green, with three triangular golden hats worn by the brotherly Cossacks, which shows that these inhabitants of the city prefer field dwelling and that the city takes tax from them."	–	–
Irkutsk "In the silver field of the shield, there is a running beaver with a sable in his mouth. This coat of arms is old."	"In the silver field of the shield, there is a running panther (babr?) with a sable in his mouth."	A beaver is depicted instead of a panther

(continued)

Table 1 (continued)

Drawing Description from the "Complete Collection of Laws of the Russian Empire"	Baron Asch's drawing Description	Conclusions and comments
Verkhneudinsk "The shield is divided into two parts. The upper part shows the coat of arms of the city of Irkutsk. In the lower part, there is a golden field with a caduceus and a horn of plenty, as a sign that this city is famous for a noble trade and the terms of trade."	"In the lower part, there is a shield cut by a horizontal line into two parts. The upper part is golden with a silver Imperial Eagle topped by two crowns on the heads and a third in the middle, holding in its talons a scepter and an orb."	The elements do not match. The only common this is the golden field. Replacing the imperial eagle with a caduceus and a horn of plenty concretizes the city's specialization. The reverse approach is not productive because by making a semblance of the coat of arms of Nizhneudinsk (consonant with the toponym), the characteristics of the city itself are lost
Nizhneudinsk "In the blue field at the bottom, there are three golden hats showing that near this city dwell the brotherly Tungus and Tartars."	"In the lower part of the shield, cut by a horizontal line into two, the upper part is golden with the Imperial Eagle extending to the half, topped by two golden crowns on the heads and the third in the middle. The lower part is green, with three triangular golden hats."	It entirely coincides in the basic composition with the earlier coat of arms of the city of Balagansk but is introduced in the two-part form of the shield. In the approved coat of arms, the eagle was removed, and the field was replaced by a blue one. Excessively overloaded composition. What was acceptable (harmonious) for the two-part coat of arms of the city of Balagansk is excessive for the three-part coat of arms. The Imperial Eagle was replaced by a babr, due to the duplication of the symbols of the upper (only viceroy) part of the coat of arms (i.e., the two coats of arms were united, the symbolism of the eagle was removed). This change makes the coat of arms more interesting. Leaving the symbolism of the eagle in a lowered status under the babr is unproductive

(continued)

Table 1 (continued)

Drawing Description from the "Complete Collection of Laws of the Russian Empire"	Baron Asch's drawing Description	Conclusions and comments
Kirengsk "In the lower part, in a golden field, there is the Kirenga River flowing and dividing into two mouths, for which the city was named."	"In the lower part, in the azure field, there are three blue stripes joining in the middle of the shield, so that from below they compose a rafter, and from its tip one strip joins to the top of the shield."	Complex symbolism. An azure forked overturned cross on a red field is not heraldic. It coincides in basic composition with the earlier coat of arms of the city of Ust-Kirensk but is introduced in the two-part form of the shield. Complicating the symbolism of the river is quite productive; the river is heraldic. Replacing the background with red is not heraldic
Nerchinsk "In the silver field, there is a black flying single-headed eagle. This coat of arms is old."	"In the lower part, in a silver field, there is a black flying single-headed eagle carrying the bow stringer down in its talons."	It is introduced in the two-part form of the shield. The eagle carries a bow in its talons. The other parts are the same. The old single-field coat of arms is preserved, but with the apparent loss of the object in its paws. The introduction of the bow with the omission of the honorary status of the coat of arms
Doroninsk "In the lower part, in the black field, there is the emerged and ripe rye, in which cornflowers are also seen, showing that this city has long cultivated crops."	"In the lower part, in the green field, there is a silver plow, next to it there is a bound golden sheaf, a harrow, and another golden lying sheaf."	Replacing symbolic elements with realistic ones. Replacing items scattered in a chaotic order with rye and cornflowers is productive enough but does not justify the use of black. The reverse approach is quite permissible
Barguzinsk "In the lower part, in a silver field, there is a sitting squirrel, as a sign that the best squirrels are caught in the vicinity of this city."	"In the lower part, in a dark red field, there is a squirrel sitting on a branch (?)."	The coats of arms are practically the same. The field is red. A squirrel sits on a branch (?) The color of the field was changed, and the branch was removed. The reverse approach is possible but not justified

(continued)

Table 1 (continued)

Drawing Description from the "Complete Collection of Laws of the Russian Empire"	Baron Asch's drawing Description	Conclusions and comments
Stretinsk "In the lower part, in the blue field, there are ingots of silver, indicating that the area of this city is rich with silver ores, where they are smelted."	"In the azure field, there is a silver house with smoke coming from the chimney standing between the mountains (Heraldically, the left part of the coat of arms is not identified)."	The simplification of symbolism to heraldic (symbolic). There is a justified simplification of a complex composition by heraldic symbolization. The reverse approach is unproductive
Yakutsk "In a silver field, there is an eagle holding a sable in its talons. This coat of arms is old."	"In the lower part, in a scarlet field, there is a single-headed eagle holding a sable in its talons."	The coat of arms is introduced in the two-part form of the shield. The field is scarlet. Replacing the scarlet field with a silver one is heraldic. The reverse approach is unproductive
Olekminsk "In a silver field, there is a flowing river. This coat of arms is old."	"In the lower part, in a silver field, there is a flowing river."	The coat of arms is introduced in the two-part form of the shield. The rest is the same. The change to the single-field structure is productive and dictated by preserving the special status of the coat of arms. The reverse approach can be considered productive only from the systematicity of the coat of arms images
Olensk "In the lower part, in a blue field, there is a silver deer, showing that this area has a great multitude of these beasts."	"In the lower part, in the gold field, there is a running silver deer."	The coats of arms are practically the same. The field is either gold or brown. The replacement of field color is productive and makes the image heraldic. The reverse approach is unproductive
Zhigansk "In the lower part, there are two sturgeons in a blue field, showing that the main trade of the city is fishing."	"In the lower part, in a scarlet field, there is a gold fishing net with floats and sinkers in an azure tip; a sturgeon swimming to the left."	A complex structure that includes a separate field with a fishing net. In the approved coat of arms, the fishing net was replaced with a second sturgeon. The replacement of a complex structure is productive. The absence of a net and the presence of a second fish indicate fishing. The reverse approach only unnecessarily complicates the coat of arms

(continued)

Table 1 (continued)

Drawing Description from the "Complete Collection of Laws of the Russian Empire"	Baron Asch's drawing Description	Conclusions and comments
Zashiversk "In the lower part, in the black field, there is a golden fox, showing that the inhabitants of this district hunt these animals."	"In the lower part, in the black field, there is a silver fox."	The coats of arms are practically the same. The fox is silver. There is not much difference between the images, but the gold color of the fox is more preferable
Okhotsk "In the lower part, in a blue field, there are two anchors with a standard above them, showing that this city has a port."	"In the lower part, in a blue field, there is a silver sailboat between two banks with fortifications (?). In the azure tip, there is a fish (whale?) swimming to the left	The coat of arms is oversaturated with elements. In the approved coat of arms, there is a symbolization. Fish, sailboat, and fortifications were removed. The simplification of symbolism to heraldic emblems is justified and understandable. The reverse approach unnecessarily complicates the coat of arms. It is unproductive to create two shades of blue
Izhiginsk "In the lower part, in the blue field, there is a part of the fortress with towers. On the middle part, there is a flag in the name of Your Imperial Majesty, which is located in this city."	"In the lower part, in a green field, there is a fortress with fortifications in gold, accompanied at the top by an unidentified object."	In the approved coat of arms, the fortress is presented in a realistic (more heraldic) form. There is an unreadable image at the top of the bottom. The realistic fortress is more spectacular than a schematic plan (top view)
Aklansk "In the lower part, in a golden field, there stands a bear, showing that there are many of them near this city."	"In the lower part, in a gold field, there is a bear pierced by a black arrow walking on its hind legs."	The bear is shot with an arrow. It probably holds something in its paws (?). The image of the standing bear is somewhat "lonely." The image of a bear walking on four paws is more preferable. A bear killed by an arrow is more interesting and looks better compositionally
Nizhnekamchatsk "In the lower part, there is a whale in a blue field, showing that there are many of them near this city in the ocean."	"In the lower part, in a blue field, there is a whale blowing water."	The whale is more realistic. The rest details are practically the same. Equivalent changes are possible in both directions

Source Compiled by the author based on (Russian State Historical Archive n.d.)

3 Results and Discussion

Considering the two groups of coats of arms, the author states that, in general, the drawings of coats of arms from the collection of Baron Asch are, for the most part, worse in terms of heraldry images. On this basis, it is possible to say that they were created earlier than the official coats of arms were approved.

Definitely, these drawings could not have been made from the descriptions after the approval of coats of arms in 1790.

The author of the drawings has some familiarity with the coats of arms of the settlements of 1777, making full use of all three images in his drawings. Undoubtedly, there is a connection between many images of approved coats of arms of 1790 and the drawing of coats of arms from the collection of Baron Asch.

If we assume that the coats of arms in the drawing are made based on the approved coats of arms, it should be noted that the author maintains piety towards the previously approved coats of arms, without distorting the basis of their images, but editing (distorting) most of the newly approved ones.

The presence of the two-part coats of arms suggests that this drawing is secondary to the coats of arms in 1777, since, at that time, the system of the two-part form of the shield had not yet developed. In turn, the very fact of placing the images of approved coats of arms of 1777 in the two-part form of the shield suggests that, by the time of the drawing, this form already represented a typical structure for Russian city coats of arms. This fact raises the lower boundary of creating the drawing, at least to May 29, 1779—the time of the first application of the two-part form of coats of arms in the system (Russian State Historical Archive n.d.).

The upper boundary of the drawing is determined based on the dating of G. F. Asch himself. In the accompanying documents, after the description of the batch of objects, which includes the drawing of the coats of arms, the Baron indicates “May 22/June 2, 1794” and the place of the collection—the city of St. Petersburg.

Thus, the upper boundary of this drawing is determined to be no later than May 22, 1794. This dating of the upper limit of the creation of the drawing does not answer the question about the prime or secondary nature of this image in relation to the approved coats of arms of 1790. Nevertheless, it removes the problem of creating the compilations of the drawings of coats of arms of a later time, which is typical for Russian heraldry (to forget about the approved coat of arms within 20 years after its approval).

4 Conclusion

Based on the above, the author recognizes the following:

1. Despite the designation of the drawing as originating from the collection of Baron G. F. Asch, its author remains unknown.

2. The drawing was created later than 1777 (this is a conclusion derived from the logic of reasoning) but before May 22, 1794.
3. Given the first approval of city coats of arms in the new two-part system on May 29, 1779, the drawing was created later than that date.
4. There is no possibility of considering that the drawing of the coats of arms was created according to the descriptions of the Decree of 1790.
5. The drawing was probably created before the approval of the coats of arms of the Irkutsk Viceroyalty in 1790 (this non-obvious conclusion stems from the logic of the analysis of approved coats of arms and coats of arms in the drawing).
6. The coat of arms in the drawing has a close relationship with the approved coats of arms, which allows us to consider the drawing and coats of arms of 1790 as a single complex.

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Provincial Town Students Speech Code Analysis (Exemplified in Komsomolsk-on-Amure)

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Abstract The purpose of the article is to identify and characterize the modern student speech behaviour peculiarities as well as to define the student speech code in provincial town. In order to achieve the given aim the descriptive method (observation and interpretation) is used in the research. The speech code of the Komsomolsk-na-Amure State University the first and second year students was analyzed in the course of the research. The material was collected by means of 76 students' observation. The most striking features of the modern student lexicon are the use of specific student speech code, play on foreign words and conscious use of substandard vocabulary as a way to experiment with the communication and language rules. The student speech code is defined by high degree of freedom from accepted in modern society communication behaviour rules. The main characteristic of the student speech code consists in tendency to make the speech striking, successful and special. Many language techniques are used for this purpose. The results of the research can find an application in further student speech code study as well as in the development of theoretical sociolinguistics, psycholinguistics and speaking etiquette courses.

Keywords Speech code · Modern students · Provincial town · Speech peculiarity · Language techniques

JEL Codes C83 · Z13

1 Introduction

Each speech community use specified communicative means. There are languages, dialects, slang, stylistic varieties of language. Every such mean can be called the code.

The speech code is the special social community language personality embodied in speech.

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The modern student is one of the most interesting and urgent type of language personality for researches. His speech code reflects current language specificity and speech communication peculiarities to a large extent. The youth easily responds the variety of changes, taken place in society, including language changes (Khimik 2016). Moreover, the youth itself influences the modern speech state and, as a result, language formation as a whole. According to the opinion of many researchers, the young people speech contains prevailing trends in live speech communication, such as appearing and accumulation of speech peculiarities, approbation of innovation, use, keeping or refusal of one or other language units.

The youth speech is unique language phenomena, the distinctive feature of which is originality, creative usage of standards, tendency to surprize and experiment.

The speech behaviour specificity of modern provincial town student worthes the special attention. The modern Russian town acts as a reflection of special closed society, in which individual, group and town interests, relations, behaviour forms, including language standards are interlaced at the different levels and in special way (Petrunina and Shusharina 2019).

The modern provincial town language study is important and urgent due to a number of reasons. The main reason is that the language of modern provincial town reflects and forms its cultural space.

2 Materials and Method

Among the last researches the most urgent are the works about language personality of a man, who belongs to the special social and age group. The examples of such groups can be scientists, businessmen, politicians, artists, etc. As the result of such division the speech code concept appears in sociolinguistics. The speech code is so-called set of rules, which define "what and how to speak in special context" (Philipsen et al. 2005). The speech code choice depends on the social group belonging. Many scientists deal with the theoretical questions of the speech codes and its belonging to different groups, but practical questions of student speech code specificity in the provincial town, notably in Komsomolsk-on-Amure, are considered not enough, therefore subject of the research is still urgent. Student is a carrier of individual speech form, which reflects his social, territorial and ethnic origin, his education and cultural level (Kostyurina 2018). Thereby, student as language personality is ordinary carrier of Russian language and appropriate object of study. Being the most progressive age group, the students reflect strikingly speech communication of provincial town as a whole. Descriptive method was used in the course of the research. Material was collected by means of a participant observation and analysed in the sequel for identification of the speech code that is typical for Komsomolsk-on-Amure students.

3 Results

Common communicative environment for a student is, firstly, a learning group, participant of which he comes. Then year, department, and university as a whole follow. The learning group refers to the second level small groups, of which a man is a member. Besides this he already refers to the first level formal groups, for example, family, and to informal groups, such as sport group, friends and former classmates. In small societies student, being sociocultural and language personality, joins personal and business forms of communication influence. Personal forms of cooperation are such micro groups as family, friends, people with the same music, sport and other interests. Business forms (in case of student) are learning group, year, department, and business company, if a student works. An important point in the description of language personality speech behaviour is the fact, that standards and values of different micro groups may not coincide or even may contradict each other abruptly. As a result, a man need to adapt to requirements of different language groups when choosing the behaviour line, including speech behaviour. In this way, the phenomena of "code switching" appears. Depending on speech requirements of defined micro groups and specific communicative environment, the student uses diverse set of speech standards and also different types and forms of speech, such as official type, conversational speech, slang, etc. For example, in the bosom of family, the student uses one code, so-called home language, which means usual form of communication among family (Philipsen 1997). Depending on social origin, educational and cultural level, it can be oral conversational speech close to literary language to some degree, or town colloquial language. Also we can face invective type of family speech communication, which means the use of abuse, insult, obscene language, typical for unfavourable families (Zanadvorova 2012). With friends and like-minded people the student switches to another code, using slang and jargon.

Communication in the learning group, year, and department means the use of literary speech form, because in the university the student communicates not only with his peers, but also with lecturers and university officers. In the case of informal communication in group, the student uses means of student slang in speech.

As a rule, the priority communication group for student is his friends, students in the same year or like-minded people. Defined speech standards and behaviour forms are typical for such reference groups. They define the way of communication between the group members as a whole. Thereby, the speech of group members determines specific speech code, which contains defined speech patterns and speech behaviour stereotypes. In order to stay "friendly" and not to lose the belonging to the group, a person needs to follow these rules and keep generality of speech means.

In this research an emphasis is made on the analysis of Komsomolsk-na-Amure State University first and second year students. Material was collected by means of participant observation of 76 students. It is worth saying, that among students, whose speech was observed, there are 18% of foreign students (Tajik). Also it is important to take into account, that the group of students is not always the group of like-minded people. Of course, they are united by their area of study, but at the same time, they

may be people with absolutely different interests and hobbies. Nevertheless, student needs to get acclimatized to this group, follow behavioural group standards and take into consideration opinions of its members for further comfortable learning and joint existence. Among the most striking features of the modern students speech code the use of student jargon, play with foreign words and unconscious use of substandard vocabulary may be pointed out. Active use of slang expressions in order to designate special everyday student actuals is the main peculiarity of the group speech communication under study. The most meaningful for the student objects, people and time cells gain different slang names.

The majority of slang expressions, used by students of provincial town, is a transformation of official names. All slang expressions, used in the modern student speech, conditionally can be divided into several topical groups, such as learning, students, time, object components of student life, student mode, lecturers, etc. (Leorda 2006).

The student speech code contains a flood of slang expressions for branches of learning and subjects names. As a rule, univerbation, abbreviation and reduced word combinations are used for subject names consisting of several words, for example, fizra—PE, vyshka—higher mathematics, nachertalka—descriptive geometry, IYA—foreign language, matan—mathematical analysis.

Certain attention should be paid to lecturer nominations, which often have slang type. Depending on age, duties, branch of learning and, frequently, on physical and psychological features, students name the lecturer—prepod/prepodsha, zavkaf, psih (psychology lecturer), anglichanka (English lecturer).

Depending on the learning age, students often confer themselves different names. In this way, for example, shortening of word "applicant"—abitura, often occurs. The first-year students are often called "green" that means the beginning of new life. Senior students are called starshaki, diplomniki, and the last means the whole period of preparing, passing and defence of the student graduation thesis.

The most important and exciting part of learning for student is passing of the test, defence of a computational and graphic task, credit and exam. These learning stages are frequently named by various scary and terrible words that express the risk for life: hell, lottery, examination, hello, army!

The next distinctive feature of the modern student speech code is frequent use of foreign words in the process of communication and variation of its forms and meanings. Modern students use Americanisms as a way of fame, music and film stars imitation. Many up-to-date Russian musicians combine several languages, when writing the songs. Thereby the language mixing becomes fashionable, noticeable and interesting. Such speech code peculiarity attracts attention of people around. Also many foreign words are adopted from computer games, which take a great interest in young people of provincial town. In view of insufficient development of entertaining urban spaces, sport schools, students spend more and more time at home by a computer. The following Americanisms occurs in the speech of provincial town students: izi—easy, fakap—failure, trening—learning, skill—skill, chekat—check. In addition, incomprehensibility of such words serves as a symbol of erudition for some people, and the speech, rich with foreign words, is frequently considered as socially prestigious.

Substandard vocabulary is often used in speech communication of modernity. Unfortunately, offensive language occurs in the speech if modern young people. In practice, all students use vernacular in their speech, but in official or semi-official communication they still try to watch over their speech and control their expressions. Mainly rude and substandard vocabulary is used by students in informal atmosphere among friends and peers, though more often there appear uncomfortable situations and the use of taboo expressions during practical classes in front of lecturer. And often this situation is uncomfortable not for student. For representatives of some social groups the use of substandard vocabulary is normal and embarrass in no way, even in front of senior people. In such cases student himself or his groupmates corrects his lexical slip of the tongue, for example, Che ty poresh vsyakyyu dich? That means—speak incorrectly.

Often the use of rude and substandard vocabulary in the speech of modern provincial student is unconscious. In such case this vocabulary is used for pause filling during the communication, and applied for designation some complex for understanding definitions: I don't understand this erynden on physics. However, thanks to desire of some students to speech etiquette standards observance we may face the expressions calling students to self-control. For example, "Do not swear like a trooper close to girls; Please mind your language close to lecturer". Also it is worth noting that not only boys, but girls too abuse substandard vocabulary. The cases of conscious use of such speech code is again explained by the desire to express oneself and mark out of total mass and also to break the communication stereotype.

Frequent use of substandard vocabulary depends on law level of cultural education. Many families in province belong to the working class. There are less intellectual families, because of big population outflow to bigger and more comfortable for living towns, and even abroad (Markova 2019).

Thereby, it may be noted, that fundamental factor of student speech code peculiarity formation is the desire to fulfil oneself and be notable by means of alienation from generally accepted speech standards.

Speaking about foreign students, it can be pointed that they have a law level of Russian knowledge and among each other usually speak on their native or mixing language, using separate Russian words. Russian students are rarely in touch with foreign students and just some tries to help and explain them complex information. More often representatives of different nations avoid each other and every stands apart with its fellow countrymen (Pershina 2020). During the first year of study foreign students adapt to new for them requirements of the Russian higher education system. The process of adaptation continues further at the senior years of study. In the communication with lecturers and peers, foreign students always use literary language norms and respectful forms of address.

The time of learning in the university is the period of personal value and interest system formation, time of one's own possibilities and abilities acceptance. Becoming a student the young man switches over the new level of his development and gains higher status. Being the student is the ideal time for self-realization. Socialization of student, making relationship in a group is impossible without social roles distribution. Entering the university is, in its own way, possibility to be distinguished, present

oneself in more profitable position, it is chance to find like-minded people. After the long staying in one and the same group at school, when entering the university, every student appears in a new light for himself and again find new testimonial of society and also the role in this society.

In order to gain prestige among group mates different ways, including speech influence, are applied (Milyohina 2018). In the course of Komsomolsk-on-Amure student speech code analysis the following factors of speech influence were noted: speech correctness, literary norms knowledge, proper relation to an interlocutor. And on the contrary, the use of verbal aggression in communication, interjection of the interlocutor, saying yes, inconsistency of asked questions, and as a result ethic norms and personal interlocutor bounds breaking are repulsive factors and do not favour the making of respected relation. Thereby, gaining the status of student, a man again goes through socialization in new for him group.

4 Conclusion

The speech code implies standards, rules and peculiarities of speech realization in some communicative group. The provincial town modern student speech code, first of all, is defined by vocabulary peculiarities and speech behaviour of all the learning group members as a whole (Sharifullin 2016). The main aim of this research was to identify and analyse the modern provincial town student speech code.

This way, the fundamental features of student speech code are the use of student slang, foreign words and substandard vocabulary.

Slang for modern students is the way to separate “friendly” members of “foreign” and strangers. Generally, the slag expressions are transformed official names, which are made by applicants and senior students, and contribute further student adaptation and socialization in new, for them, university environment and in groupmates micro group particularly. Different expressive nominations, similar to the youth slang as a whole, present specific slang expressions group. Being the student, a person is not a child and schoolchild anymore. He moves up to a new level of his social formation.

The next striking peculiarity of student speech code is the use of borrowed words in the speech.

The student representatives in provincial town use substandard vocabulary and even uncontrolled vocabulary in their speech more and more often. These speech components are of an unconscious and conscious type of use.

The student speech code is defined by big degree freedom of accepted in modern society communicative behaviour rules. As a result, constant speech standards breaking and weak one’s own speech control appears (Krysin 2018).

However, the stimulus for literary standards and ethically proper expressions usage is the desire for authority winning and successful adaptation in the society. The main feature of the modern provincial town student is desire to make his speech more striking, interesting and, as a result, successful.

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The Image of Chinese Political Power on the Pages of the People's Daily Newspaper

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Abstract The purpose of this study is to identify the features of the image of contemporary political power in China, formed by official "People's Daily" publications. This study uses a culturological approach to studying the image of power. This approach involves the use of a set of cultural studies methods aimed at interpreting discourse, analyzing thematic blocks of printed publications devoted to the political power. An analysis of the linguistic, semiotic, "inter-discursive" features of the newspaper publications helps to estimate the trends in Chinese state policy and foreign affairs at present, the features of formation of attitude to political power of the Chinese, and the peculiarities of political power as a cultural phenomenon. The study has found that the topic of political power is one of the central topics covered by the official publication of "People's Daily". Almost all the newspapers in China are owned by the state government. The image of political power formed in newspaper publications is clearly structured and includes several components: the holder of power, the direction of political activity, and the estimating characteristics of the power. The culturological approach to the study of the image of political power formed by print media makes it possible to identify the national-cultural features of the phenomenon under study that cannot be established using philosophical, political science and sociological approaches. An analysis of the materials of the People's Daily printed publications represents the "official" image of state power promoted by the ruling party of China.

Keywords China · The image of political power · "People's daily" · Culturological approach · Periodicals

JEL Code Z1 · Z18

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1 Introduction

Studying the image of modern Chinese political power, it is necessary to take into consideration that to a large extent this image is formed and broadcasted by the media. Such a process of transmitting information has significant impact on the formation of the values of society, the national view of the world and the nature of relations between citizens and the authorities. Currently, the Chinese media is a developed information system, which is one of the leading in the world and has huge impact on public opinion and the formation of an image of political power. Thus, print media is one of the instruments used by the party to organize political communication.

Printed newspapers in China play an important role in the contemporary propaganda system. Despite the rapid development of modern information technology, print media remains one of the main sources of information for the Chinese population. This is due to the high prevalence, relatively low cost of newspapers, and the fact that many information resources remain not available in China, due to the fact that the government controls the flow of possible "inconvenient" information from abroad and imposes strict censorship.

The purpose of the study is to conduct a comprehensive analysis of the image of modern Chinese political power, broadcast by the official "People's Daily" publications.

Research objectives:

1. To identify the main thematic blocks of printed publications dedicated to the political power of China.
2. To analyze the estimating characteristics of the image of political power represented in the publications of "People's Daily" newspaper.

2 Materials and Method

This study was carried out as a part of culturological approach which purpose is to identify national-cultural characteristics of the phenomenon of Chinese power. This approach is implemented applying a variety of methods: discourse analysis which allows to identify the socio-cultural background for the formation of the image of political power, semiotic analysis, the structural method which are used to identify the degree of social changes in society, especially the formation of attitude towards contemporary power and the ruling party's course, to increase prestige of government (Shuneyko and Chibisova 2019).

The analysis involves printed materials of the "People's Daily" (Chinese "人民日报") central newspaper, issued between 2002 and 2018 (人民日报 Renmin ribao 2017). This newspaper was chosen as the research material as it is supposed to be one of the leading and the most authoritative newspapers, not only in China but also all round the world. Its edition is about three million copies (Chu 2015).

As a part of a study 200 newspaper publications were analyzed. As units of analysis, articles devoted to various kinds of reflexing of power were selected. The

thematic structure, the nature of the events described in the publications, holders of political power as well as evaluative characteristics were analyzed (Shuneyko and Chibisova 2020). The rating scale used in the research varies in the range of "positive", "neutral", "negative".

The high degree of scientific study of the formulated problem is evidenced by the multiplicity of works published on it, including the works of Bierstedt (2007), Petrunina and Shusharina (2019), Wang (2016) and Zhao (2006).

The author also used the materials from China culture (2020) New era of Chinese culture (2020) and from World press freedom index (2020).

3 Results

China is a country that has preserved centuries-old traditions, distinctive culture and unique mentality that differs significantly from that prevailing in European civilization. This fact explains the reason that causes significant difficulties in establishing cooperation with China for Western partners. Models of cooperation that are optimal for European states are not applicable for interaction with China. This is one of the most urgent and complex problems of establishing successful business communication with an Asian partner. To solve this problem there is a need for deep understanding of the national-cultural features of the modern system of the Chinese government and the institution of political power (Musalitina 2019).

The modern Chinese leadership, including the Information Council of the State Council of the PRC (People's Republic of China), pays special attention to the media as an instrument for popularizing fundamental cultural values and political views of Chinese society on the world stage. Central print and online news publications are issued in Chinese and several foreign languages, which undoubtedly increases the possibility of obtaining up-to-date information about China for foreigners. In turn, access to the Western society of information from the original news source assist to strengthen the position and authority of the Chinese media in the international community.

Turning to the consideration of representation of the image of Chinese power in print media, it should be noted that the Chinese constitution guarantees the right of every citizen to receive complete and reliable information on any issue of public life. It also guarantees the right to open and free discussion of any socially significant issue Li (2011). However, in reality, the situation is significantly different from the norm prescribed in the constitution China law center (2019).

Despite the fact that China declares policy of democratization of society and the media, there is still a strong position that the party must inform the society only about information that does not go beyond its interests. This idea of the ruling elite contributes to the preservation of propaganda as the main function of the media (mass media). Thus, Hu Jintao Chairman announced the need to strengthen the party's work in the direction of media control (Gamza 2019).

China's intension for taking world economic and political leading positions required the ruling party to review some of the tasks assigned to the national media. Firstly, there was an urgent need for the government to change the system broadcasting "inconvenient" topics. So, until 2017, anti-government rallies and riots in Taiwan, protests in Tibet were reflected only on the pages of few and short publications of the domestic press, being a prohibited topic to broadcast among foreigners (Vinogradov 2014). However, attempts to smooth out internal political problems on the pages of information issues and to hide urgent national conflicts from the world community have led to sharp criticism of the censorship of the PRC which prevails over the real facts.

Due to the situation in the past few years the leaders of the Information Department of the State Council of the PRC has changed its policy of "concealing the information" to a policy of "dosed information coverage" which allowed foreign audience to receive up-to-date information about events in China in a pure form without critical analysis and interpretation of foreign politicians. At the same time, the range of topics covered in central print and Internet publications in China has expanded significantly.

The thematic structure of publications about political power in the "People's Daily" newspaper is further considered:

1. **The activities of the party**. This discursive presentation is the largest thematic group of analyzed printed materials. The issues of personnel policy of both the regional branches of the party and the central committee are highlighted:

四川省委组织部发布一批干部任前公示 国务院任免国家工作人员	The organization department of the Sichuan Regional Party Committee announced a number of staff (02/05/2016) The State Council appoints and dismisses national staff 06/29/2003)

Source made by the author on the basis of «Renmin ribao», 02/03/2016

The following quotation from the article illustrates faith in the party as power capable to bring constructive changes:

"有了全面从严治党, 我们才起死回生"	With comprehensive and strict party management, we can be revived (13.04.2015)

Source made by the author on the basis of «Renmin ribao», 07/05/2015

In the example below the key idea is the thought of the need to improve the status of party members:

中国石油吉林油田公司: 党员 “塑形工程”—锤炼党员先进形象新载体	Petro China Jilin Oil and Gas Company: “Formation project” for party members—a new way to improve the image of party members.” (19.09.2005)

Source made by the author on the basis of «Renmin ribao», 19/09/2005.

Organization problems and internal current events of the party are also highlighted in publications:

中国共产党为什么能深入推进自我革命—人大常委会十七次会议举行第二次全体会议	Why the Chinese Communist Party can make an inner revolution (02.03.2003) The seventeenth meeting of the Standing Committee of the All-China Assembly of People’s Representatives holds the second plenary meeting (02.03.2003)

Source made by the author on the basis of «Renmin ribao», 02/03/2003

2. **The foreign policy of the party**. This is the second largest group of publications on the topic of power in the People’s Daily. Wide coverage of foreign policy is not accidental. The policy of “soft power”, which implements China in the XXI century. The priority goal is to improve the prestige and status of the PRC not only among Chinese citizens, but also at the global level (Chan 2009). To achieve this goal, the media is an effective tool aimed at creating a positive perception of the Chinese authorities. The publications represent many partner countries and areas of international cooperation. Moreover, interaction with foreign countries is described in a positive tone. The table below represents the results of the analysis of this thematic group covered in publications:

Partner country	Area of cooperation	Example from publication
Russia	1. Partnership 2. Eastern Economic Forum 3. Scientific and educational cooperation	关于中俄友谊, 习近平提到过这些人那些事—Regarding Sino-Russian friendship, Xi Jinping mentioned these things (04.01.2003) 习近平出席东方经济论坛为中俄全方位合作带来新机遇—Xi Jinping's participation opens up new opportunities for comprehensive cooperation between China and Russia (09.12.2008) 习近平和俄罗斯总统普京共同访"海洋"全俄儿童中心—Xi Jinping and Russian President V. Putin visit the «Ocean» Russian Children's Center (21.08.2014)
Monaco	Partnership	习近平同摩纳哥元首阿尔贝二世亲王会谈—Xi Jinping conducted negotiations with Prince of Monaco Albert II (19.10.2017)
United Arab Emirates	Trade and economic cooperation	习近平在阿联酋媒体发表署名文章—Xi Jinping publishes a signed media article (27.11.2014)
Asia–Pacific countries	Military-strategic cooperation	维护亚太和平引领地区繁荣—Peacekeeping region—regional prosperity in the Asia–Pacific area (16.02.2018)
Germany	Economic cooperation	李克强再晤默克尔: 中国驻德大使告诉你中德走得多近—Li Keqiang meets Merkel again: Chinese ambassador to Germany tells how close China and Germany are (09.09.2013)
Portugal	Trade and economic cooperation	中葡论坛秘书长徐迎真: 促进中国和葡语国家经贸合作—Xu Yingzhen, Secretary General of the Sino-Portuguese Forum: promoting economic and trade cooperation between China and Portuguese-speaking countries (16.12.2002)

(continued)

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Partner country	Area of cooperation	Example from publication
Nepal	Partnership	跨越喜马拉雅的友谊! 习主席今天首访尼泊尔 Friendship through the Himalayas! President Xi's first visit to Nepal today (07.11.2003)

Source made by the author on the basis of «Renmin ribao», 07/11/2018

As it can be seen from the above data in the publications, much attention is paid to the issue of international relations. It presents a wide range of issues on which the Chinese government builds cooperation with foreign partners.

3. **Offenses and punishment of the officials** This thematic group ranks third in the frequency of references to political power in publications. Over the past few decades China has faced rapid increase in corruption among officials. It is mentioned by the government that this problem is of national importance. The authorities actively fight corruption by applying the toughest measures to offenders (Vinogradov 2014). Regular coverage of trials and strict decisions by politicians and corrupt politicians in the media is one of the means of promoting "honest" activities. The articles mention the names of senior officials:

吉林省市场监督管理厅原党组书记, 厅长林玉成被 "双开"	Lin Yucheng, former party secretary and the director of the Jilin provincial market Supervision and Administration Department, was prosecuted (16.03.2007)
中国石油广东销售分公司党委原副书记, 原总经理何瑞林被开除党籍	He Ruilin, former deputy secretary of the party committee and former general manager of the Petro China Guangdong sales department was fired from the party (12.01.2018)
广州花都区政协原主席受贿外逃女儿出庭受审	The former chairman of the CPPCC in Guangzhou District took bribes and fled, his daughter stood trial (29.06.2012)

Source made by the author on the basis of «Renmin ribao», 12/01/2018

The following is the most common vocabulary of this thematic group that form the image of criminal official: bribe, fled, stood trial, was dismissed from the party, sentenced, disciplinary violations of officials, serious violations of discipline and law ("People's Daily", 23.09.14; 15.08.16;17.01.18).

A particular group of publications reflecting the peculiarities of the image of Chinese contemporary political power is represented by **articles devoted to the reaction of the state leadership to riots and rallies of protesters in certain regions of China**. Previously such information was not allowed for open publication and was

strictly controlled by the state censorship apparatus. However, due to criticism of the world information community the news about opposition movements found its reflection in the pages of Chinese central newspapers including the "People's Daily":

罪犯的行为绝不能归因于 "和平示威", 它们无非就是暴力和犯罪. "示威者" 杀害了无辜的公民, 他们的残酷对待引起了西藏各界的极大愤慨和强烈谴责."	The actions of lawbreakers can in no way be attributed to a "peaceful demonstration," they are nothing more than violence and crime. So called "demonstrators" killed innocent citizens, their cruelty caused extreme indignation and sharp condemnation of various circles of the public of Tibet" (29.06.2012)
鼓吹 "西藏人权" 煽动民族情绪, 借以获得西方支持, 最后实现 "藏独", 分裂中国——由此, 我们可以看出达赖集团的 "西藏人权问题" 到底是什么问题了	Inflate national feelings by preaching the so-called "Human rights in Tibet" thus gaining the support of the West, and ultimately achieve "independence of Tibet" and nonconformism in China, all these can make clear what Dalai Lama raised is the "human rights problems in Tibet" (30.04.2008)
特区政府负责人梁刚英今天在电视讲话中说, 当局和警察有义务恢复公共秩序, 保证该区居民的生命和财产安全	The head of Xiangang independent administrative district—Liang Zhenying address to residents on TV program declaring that the authorities and the police are obliged to restore public order and guarantee the safety of life and property of residents of the district (08.10.2014)

Source made by the author on the basis of «Renmin ribao», 08/10/2014

In the above quotes the position of the official authorities of China is clearly traced. It is based on the intention to maintain order, the territorial integrity of the state and national sovereignty. Oppositional speeches are presented in publications as negative, destructive force. Thus, Beijing also makes it clear to the West that the government takes all possible measures for peaceful settlement of the conflict and in this way Chinese authorities appear in a rather attractive light.

The most essential thematic groups, which reveal the image of power, can also include "politics of the socio-economic development of China", "economic development course", "charitable activities of the party", "society and culture". In general, these thematic blocks represent the official Chinese government as strong, stable, and progressive.

The second criterion for analyzing representation of the image of political power in the media—"the holder of power" will be further considered. Three types of the holder of power images can be distinguished in newspaper articles. The first of these is Xi Jinping, the current chairman of the Chinese Communist Party (98—the number of references from 200 analyzed articles), the second type represents officials of the state apparatus of power: Zhang Baifa, deputy mayor of Beijing; Shang Huaijun, deputy mayor of Dezhou; Wang Ventao, governor of Heilongjiang province; Huang

Ming, member of the Central Political and Legal Committee, etc. (in general 65 references in the analyzed articles).

The third type is government departments and ministries: The Ministry of housing, urban and rural development, the Maritime inspection team, the Ministry of finance, the Environmental protection department, the Department of Justice, the Central Discipline Inspection Commission, the University of National Defense, etc. (18.09.2014).

The analysis of the evaluative characteristics of the image of power showed that in most cases the image is not accompanied by expressive-evaluative vocabulary. Thus, only occasional cases of denotative assessment of activity of the authorities of all the media discourse texts considered were revealed: "习近平的回应激发了乾隆编辑团队的热情, 因此决定使用原始的迷人动画图像来介绍该国主席的国外访问, 会议和视察情况" ("Xi Jinping's response inspired the Qianlong team of editors; it was decided to use original fascinating animated images to present the situation with foreign visits, meetings, and inspections of the country's chairman …") ("People's Daily", 10.11. 2016).

There are also few estimations with connotative meaning: "中国经济有底气信心足" (Chinese economy has confidence); 治理者说: 巧解 "疙瘩" 方能温暖民心 (The governor says "Reasonable understanding of problems can warm people's hearts"). In general, the image of political power is not accompanied by criticism and an analytical approach ("People's Daily" 13.12.2017).

4 Conclusion

The analysis made it possible to draw the following conclusions: in the framework of the "People's Daily" discourse there are four main thematic blocks that reflect the theme of political power: party activity (43% of the total number of articles analyzed during the study), China's foreign policy and foreign partners (22%), offenses, cases of taking bribes and punishment of officials (16%), government reactions to riots in certain regions of China (11%) and other topics dedicated to the problems of Chinese contemporary authorities (8%).

The image of political power on the pages of "People's Daily" is generally neutral or positive; there are no negative characteristics and criticism. Most of publications inform readers about the main events related to power, authorities, and their activity, avoiding evaluation and analysis. Attention is focused on the effective work of the government apparatus in deciding the problems existing in various areas of Chinese society.

The study found that the topic of political power is one of the central topics covered by the official "People's Daily" publications. The absence of negative assessment of the activity of the current government indicates the prevalence of the print media's goal to improve the prestige of the ruling communist party and strengthen the course of both domestic and foreign policies of China.

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Antimetaphysical Strategies in the Western European Philosophy of the Modern Times

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Abstract The main purpose of this article is to substantiate that the overcoming metaphysical approaches in the philosophy of the New Age, which have lost their relevance due to the limitations of their methodology which suggested that all philosophical issues exist within clearly defined frameworks of metaphysically oriented systems, served as the basis for the formation of the image of scientific knowledge of the era of intelligent machines. This article makes the conceptualization and analysis of the anti-metaphysical direction in Western philosophical tradition as a source of theoretical and methodological scientific changes in the era of intelligent machines. While studying the problem of the article, the authors substantiated:

– a change in the perception of the world of objects and understanding of a person's place in the structure of reality led to the fact that in the nineteenth century a new anti-metaphysical trend was formed in the New European philosophy on the basis of various previous directions. The rejection of the metaphysical examination of man in an essential manner made it possible to include components that were not available to previous models in the anthropological horizon.
– a change in the scientific paradigm in the nineteenth century, which emancipated the patterns of Western philosophy of science from metaphysical philosophical systems, ultimately became the basis of scientific and technical transformations and worldviews of the modern era, where intelligent technical devices are becoming increasingly important.

In the context of the development of the information society and its technologies based on intelligent machines, modern man is forced to live in an informational reality that has an ontology, which requires the study of new categorical and methodological tools that can be developed on the basis of antimetaphysical strategies of the Western European philosophy of the New Age.

Keywords Metaphysics · Antimetaphysics · Philosophy of the new age · Idealism · Critical philosophy · Anthropology · Materialism · Philosophy of science · Worldview · Intelligent machines

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1 Introduction

Despite the various interests, motives, and goals of the many philosophical trends that are currently appearing on the modern philosophical scene, they all come to an agreement when it comes to the context of their functioning. Here, representatives of different directions agree that the contemporary discourse of philosophy is identical to the context of post-metaphysical thinking. For example, the theory of deconstruction by Derrida (2019), and the theory of communicative action of Habermas (2012) or the modern "spherology" of Sloterdijk (2019), all of them indicate that the modern philosophizing should be thought of taking into account the apparent demarcation with the metaphysical tradition of Western philosophy.

Especially relevant is the antimetaphysical methodology, which enters into discussion with the metaphysical theories of artificial intelligence in the context of modern philosophical and scientific knowledge.

2 Materials and Method

The post-metaphysical orientation of modern philosophy is inextricably linked with the anti-metaphysical tendency in the Western European philosophical tradition, representing a consequence of the transformation of "philosophical strategies in relation to the language of philosophy. Philosophy is understood not so much as a study, but as a multiple interpretation, taking into account the figurativeness of the philosophical language" (Malkina 2017). Thus, in order to understand the main components of modern philosophical discourse, it is necessary to turn to the key points in the ideological history of criticism of metaphysics (Peshkov 2021). This is primarily about the philosophical tradition of the New Age, and, in particular, about what was the logic of rethinking the patterns of Western European philosophy in the nineteenth century. A study of the possibility of developing and applying anti-metaphysical discourses in the context of modern humanitarian knowledge was started by the authors in a number of works (Vorokhobov 2018; Semikopov and Zakhriapin 2021; Gryaznova et al. 2019, 2020a, b).

3 Results

One of the most striking characteristics of the tradition of Western metaphysics, and especially its philosophical component in the New Age, is not only that it seems to be a unity formed on itself and its history, but also that it purposefully forms a position

according to which outside of its boundaries, any reliably substantiated philosophical knowledge seems impossible (Helvetius 2019; Straks 2017). The situation is as if any question and any answer concerning this tradition is posed and resolved only within the boundaries of this tradition itself, that is, based on its logical principles and axioms, its laws and rules, its rational procedures, and so on so that any attempt to think outside these limits is regarded as an enterprise that was initially doomed to failure. Thus, the Western metaphysical philosophical tradition of the New Age is such a space where any philosophical statement of the problem must find its solution in the paradigm of clear rules. The reliability and validity of such an approach begins to lose its relevance when attention is drawn to how representatives of the metaphysical tradition of the West try to clarify the diverse interests and issues of philosophy, starting from the desire to minimize philosophical issues and subordinate their intentions (for example, substantiating the scientific status of philosophical knowledge) all ideas and proposals produced by philosophical discourse. In this case, metaphysics is no longer an all-encompassing knowledge, with the help of which it is possible to resolve all possible issues, but only in this way of thinking, using which it is possible to achieve some predetermined goals.

The process of placing a person in the center of peace and culture in the era of the New Age, contributed to a new anthropological understanding, when the old models were rethought, perceiving a person mainly as a created soul or as a pure consciousness. Old approaches began to be perceived as limiting emerging trends in the change of individual and political aspirations for a free life. As far as philosophy is concerned, the metaphysical concept was still closely connected with the religious worldview, in particular, the works of representatives of German idealism testify to, which contradicted the assertion of the complete autonomy of a man in the world.

Various authors who directly criticized metaphysics understood their own enterprises as an inversion of metaphysics. For example, from the point of view of K. Marx "For Hegel, the process of thinking, which he turns even under the name of an idea into an independent subject, is a demiurge of the real, which is only its external manifestation. For me, on the contrary, the ideal is nothing but the material, transplanted into a human head and transformed in it" (Marx 1986). Moreover, critics of metaphysics never left their theoretical horizon (humanism). Actually, they wanted to unblock the path of "genuine humanism" in various ways, criticizing and radicalizing the premises of the philosophy of the New Age.

Firstly, thinkers involved in the creation of a new concept of philosophy sought to overcome the idealistic background, which has traditionally been the basis of Western philosophy. Idealism for these new theorists was a source of reduction and, in most cases, denial of the plurality of world phenomena, the main cause of all errors and errors that impeded the potential of philosophy. For these thinkers, theological conceptualization, suppressed by the philosophy of modern times due to its limitation of the absolute autonomy of man, by taking his essence and origin beyond the phenomenal world, was the logical consequence of the metaphysical premises from which idealistic thinking itself proceeded. That is why the suddenly appeared materialism became such a theorizing method, which tried to include and express physical reality in all its complexity, including man. However, after a long time, the most

important motivation for the emergence of philosophical materialism was discovered in the French and English Enlightenment. Ideas began to be considered not as eternal entities to which the phenomena of the world are subordinated, but rather as the result of a person's bodily and physical activities that could evoke all spiritual ideas through the impression made by external objects on his feelings (Feuerbach 2019). In the development of the achievements of the French materialists of the eighteenth century, human susceptibility and activity were elevated to the position of the source and beginning of the world of ideas (Habermas 2012).

Secondly, the need to develop a new concept that abolishes the primacy of theory before practice arose as a logical consequence of the question regarding the idealistic background of Western philosophy. If the task of philosophy is no longer reduced to the study of the eternal essence of ideas, but deals with the clarification and study of natural and bodily phenomena from the point of view of their material activities and circumstances, it becomes necessary to determine the qualities of this particular activity not for the sake of theory, but for the sake of practice. In contrast to the Hegelian approach, where one of the most important tasks of philosophy is to think about the past, the main goal of a new understanding of philosophy was to understand the various properties of human practice, and then change the life of people on the basis of this knowledge, which, however, some philosophers previously spoke about the Age of Enlightenment. "We will work without reasoning,—Marten said,—this is the only way to make life bearable" (Voltaire 2000).

Thirdly, the more new theoreticians put forward claims to the idealistic prerequisites of philosophical knowledge and abandoned them, the more strengthened the position for which the search for the ontological truth or ontological essence of things outside the existing world expressed only the inability of various philosophers to take into account the complexity of the world. The classical philosophy of modern times has always considered man from the point of view of his identity, when his physical properties were considered insignificant features of his being, dependent on the action of time. On the contrary, consciousness represented for her a constant anthropological mode of existence, which could subsequently be considered the subject of human reality. Even G.W.F. Hegel, who took the historicity of the spirit as the most important feature of his philosophy, thought a man from the point of view of consciousness and conceptualized his changes in accordance with the eternal rules of logic. In contrast, the criticism of metaphysics suggested the essence of human existence as a social and historical result of the development of man himself, that is, as a result of empirical life, for understanding, which you can only think a posteriori. For this new understanding of philosophy, the former metaphysical concept of man meant an abstraction or restriction of its various qualities, to which it paid no attention (Feuerbach 2019). The rejection of the concept of the subject began precisely with this criticism of the idealistic understanding of human identity. The classical philosophy of the New Age thought human existence as a subject, since its goal was to find an invariable order of human identity to substantiate scientific knowledge, the highest goal of which was to achieve absolute certainty. At the same time, in favor of criticism of metaphysics, the real existence of various human characteristics, beyond the exclusively philosophical interest of thinkers (that is beyond the

theoretical discussions about the definition of various terms), testified. This directly meant a rejection of faith in a single trait that constitutes a human personality a priori, and recognition of various traits of human existence, whose identity is determined only a posteriori and never in an absolute way. Nevertheless, this distancing from the classical definition of a person as a subject did not mean a way out of the humanistic tradition. On the contrary, with the rejection of the idealistic definition of man, a new idea of him arose, allowing us to consider his diverse qualities without any theoretical limitations. Paradoxically, in this case we can talk about humanism without being a subject. Here again it is necessary to make a reservation that in the case of this theoretical phenomenon we are talking only about the trend. Thinking focused on human identity continued to exist, although with the passage of time it became less and less focused on the previous metaphysical premises, regarded as anthropological ontological properties.

As the fourth characteristic of the new concept of philosophy, the increasing role of critical thinking should be mentioned. Although I. Kant was the first to emphasize the importance of criticism for philosophy, his proposals and intentions were radically opposed to the interests and intentions of the new philosophers. For him, criticism was still considered a method of limiting the nuances of metaphysics, so that, ultimately, metaphysics itself could be strictly scientific. On the contrary, theorists who questioned the whole tradition of Western philosophy, defined criticism as the most important tool by which metaphysics, and with it the whole idealistic tradition, should be destroyed. Their goal was precisely to overcome metaphysics, and not its salvation. At the same time, they wanted to replace the defeated metaphysics with materialistic and non-religious thinking, which could fully comprehend the complexity of human existence.

The fifth characteristic of criticism of metaphysics in the nineteenth century was the final implementation of the Enlightenment, namely, the complete liberation of people from religious and social shackles. Human freedom no longer seemed to be a problem that impeded the philosophical goals of critical philosophers but became an end in itself, to which all theoretical efforts should have been directed. Between the necessity of science and the unpredictable freedom of man, the critics of metaphysics chose the latter, and thus they removed the problem, which had long worried thinkers of the New Age regarding the assumption of a thinking subject, fully justified by philosophy as a science, of its undoubtedly substantiated essence, and of the acceptance of the presence of the alleged free will or free will which is the basis of the subject itself, which jeopardized the justification of philosophy as a science.

The first thinker, who summarized various versions of criticism of the mentioned metaphysics in his philosophy and thereby developed a new and independent concept of freedom that goes beyond the concept of the subject, was K. Marx. Further, F. Nietzsche became the most striking critic of metaphysics in the nineteenth century, pointing out the failure of the essential understanding of the subject and ascertaining material reality as the only genuine one (Frolova 2016; Sapozhnikov et al. 2018).

Criticism of metaphysics in the context of rethinking the strategies of philosophical knowledge in the twentieth century was directly or indirectly developed by such thinkers as M. Heidegger, M. Horkheimer, L. Wittgenstein, J. Habermas, R. Rorti, J.

L. Marion, A. Badiou, J. Wattimo, M. Blanchot, V. Decombe, M. Henri, E. Levinas, J.-F. Lyotard, and many others. The main trends in the post-metaphysical philosophical tradition are projects focused on phenomenology, hermeneutics and deconstructivism (Yashkova et al. 2020; Malkina 2017; Miller 2019). The anti-metaphysical trend in Western European philosophy has become the basis for the possibility of the emergence and development of technologies and the era of the culture of intelligent machines, which in the modern world are decisive in the individual, social, and economic spheres (Allen 2017; Russell and Norvig 2010; Ansotegui et al. 2019; Sapozhnikov et al. 2018).

The concept of the subject in the antimetaphysical strategies of the New Age is today becoming the basis of the artificial intelligence methodology in connection with the study and modeling of human neural processes (Ashman and Conway 2002).

The metaphysical approach used without appropriate philosophical reflection and criticism in studying the problems of cybernetics and artificial intelligence considering the correlation of human thinking and the capabilities of computers, which is often replaced by the question: do machines think? Such a formulation of the problem leads to endless and fruitless discussions about the possibilities of artificial intelligence.

Before taking this or that position on this issue, it is necessary to determine the initial methodological guidelines that are presented in the anti-metaphysical strategies of the New Age. The most important element here is the concept of the subject, which is considered to be a person and the various communities that he creates in modern scientific literature. Violation of accepted principles in the methodology of subject-object relations leads researchers of artificial intelligence to the opinion that the technical device is capable of being a subject, i.e. to be equated with a person. J. Moore, for example, believes that the computer can be seen as the subject of decision-making (Moor 1985).

Probably, the question should be formulated in the language of the antimetaphysical strategies of the New Age: "Can the artificial intelligence system play the role of the subject?" In other words, such an understanding of the role and place of intelligent machines in a person's social life leads to the need to introduce the concept of a "quasi-subject," and not to use a one-sided, metaphysical approach in understanding the essence of the subject. In this case, we remove the controversial points, because we don't put an equal sign between natural and artificial intelligence, but point out the possibility of increasing the roles of a machine, which it can fulfill as technological progress develops and of decreasing it in a person as his social life is technized. Thus, the question remains about the limiting boundaries of human transmission of these roles to intellectual technology. The most important issue in the study of the interaction of natural and artificial intelligence is the problem of the degree of subjectivity of a quasi-subject in these relations, and not the identification of man and technology.

4 Conclusions

The current study proved that:

- the anti-metaphysical orientation of the late West European philosophy of the New Age is associated with the cultural, historical, social and intellectual changes that were especially evident in the second half of the nineteenth century. A change in the paradigm of understanding the world of objects and a person's place in the world has led to the fact that people began to be perceived as the only adequate tool for understanding reality in general. Transformations of the perception of anthropological phenomena, in particular freedom, entailed the fact that metaphysics began to be regarded as such a system of theorizing that ignores reality with its nuances and uncertainty.
- a change in the focus of the scientific paradigm, with an emphasis on material reality, led to a change in the mechanisms of production, when special emphasis was placed on the use of machines, and the machines themselves began to be perceived mainly as machines. The evolution of technical production in the second half of the twentieth century, the basic presumptions of which were laid down in the nineteenth century, contributed to the growing importance of non-equipped intelligent technologies.
- modern science, following the antimetaphysical strategies of the nineteenth century, is practice-oriented, which, in addition to focusing on the interaction of theory and practice, science and education, leads to a dominant trend and the creation of a variety of intelligent machines, since all relevant scientific research should be due to relevant social and individual needs. This state of affairs owes its existence to the philosophical tradition of the New Age, which abandoned the search for truth in the intelligible world and sent its efforts to comprehend material and social reality.
- modern science, focused on the creation of intelligent machines, comes from the new European concept of consciousness, studying the limits and possibilities of its modeling. Artificial intelligence should be understood only as an amplifier of human intellectual abilities, but not as identical to it.

This study will be the next step in the development and adaptation of philosophical methodology to the modern requirements of scientific knowledge. Philosophical methodology allows one to develop a categorical apparatus based on the antimetaphysical strategies of the New Age, which make it possible to formulate the problems of the relationship between natural and artificial intelligence and develop solutions to them in a strict scientific language.

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Research of the Psychological Structure of Technical Thinking

Mariia V. Mukhina, Zhanna V. Chaykina, Tatyana N. Tsapina, Lyubov I. Kutepova, and Zhanna V. Smirnova

Abstract The current level of technology development identifies the problem of technical thinking of a modern individual, which initiates the development and testing of new ways, forms, and methods of technical thinking development in the modern educational process. The study of this issue is of prime importance for universities that train employees in "man-technology" field, as technical thinking is one of the most important competencies not only of engineers, but also of teachers who train specialists and bachelors working with technical objects. In the course of the research, theoretical and practical research methods were used, such as analysis, synthesis, generalization of teaching experience, experimental method, quantitative and qualitative processing of results, observation, and static methods. It is revealed that technical thinking is an independent type of intellectual activity, new components of technical thinking in the psychological structure are identified and the methodology aimed at its development is created. The developed method has a significant didactic potential capacity and helps to increase the level of technical thinking development. Technical thinking is one of the most important professional strengths of an engineer and has a significant impact on the level of professional training of future bachelors and specialists for the technical field.

Keywords Technology development · Technical thinking · Psychological structure · System of cognitive tasks · Professional strengths of an engineer · Bachelor training

JEL Codes I 20 · I 21 · I 23 · I 26

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1 Introduction

Addressing the Federal Assembly, Vladimir Putin said: "Today, those countries are becoming development leaders that are able to create breakthrough technologies and use them to form their own powerful production base… The proficiency of engineering personnel is becoming one of the key factors of the state's competitive ability and, crucially, the basis for its technological and economic independence." Vladimir Putin confers responsibility for highly professional engineering personnel's training on universities. "It's time to stop chasing for the quantity of specialists but focus on the quality of training, to organize the training of engineers in strong universities…", as well as on schools: "the school should cultivate an interest of engineering work", which makes the problem of engineering training in the modern educational sphere more immediate (Avdonina 2019).

According to experts' forecasts, engineering professions will be steadily in demand in the near future. In Superjob.ru study, an important event was recorded: the demand for engineers increased by 19.6%. This means that there is a new interest in specialists and bachelors in technical fields (Ilyashenko et al. 2018).

One of the most important professional strengths of an engineer, which has a significant impact on the level of his proficiency, is technical thinking, but the teacher's technical thinking, who trains future employees in the field of "man-technology", is not less important.

The most significant research in the field of technical thinking was performed by T. V. Kudryavtsev, Yu. A. Kontseva, I. S. Yakimanskaya, S. M. Vasileisky, P. I. Ivanov, B. I. Obshadko, V. V. Chebysheva, O. A. Bulavenko, M. G. Davletshina, M. M. Zinovkina and other scientists who carried out experiments with schoolchildren, engineers, and designers.

In recent years, technology has made a huge leap in its development, which, of course, requires improving the structure of technical thinking and matching the development level of processes and technology that make it possible.

2 Materials and Method

The methodological frame of the research is based on the provisions of competence, system-activity, and personal approaches. To achieve the aim and objectives of the research, the following scientific methods were used: analysis of philosophical, psychological, methodological literature, standard documentation; as well as empirical research methods, such as: observation, teaching experiment, qualitative and quantitative analysis of results, methods of mathematical statistics for processing experimental data. The conceptual frame of the research is based on the ideas of prominent psychologists (L. S. Vygotsky, V. V. Davydov, S. L. Rubinstein, D. B. Elkonin, etc.).

3 Results

Today, technology has entered every home. It is developing and will develop, which means that the number of people who uses complex technical systems will increase. However, at the current pace of life, we do not always realize how closely we are connected with technology and depend on it. "Today's generations take electric lighting, telephone communication, and many other achievements of science and technology for granted, not even like benefits, but like conditions of normal existence. A modern person is born into the world of technology, he/she uses its services in everyday life, works with it in production, and sees that new devices, technologies, services, materials appear in all spheres of public policy" (Simonenko 1994).

At an early age, a child learns how to use technology at household, and receives more serious technical training at school, using modern equipment at technology, physics, chemistry and others. Therefore, the teacher plays a great role in this process. The teacher, as always, has a two-pronged task: to initiate students into the elements of technology (in accordance with the curriculum) and to develop their technical thinking so that they can successfully navigate the world of processes and technology. However, for this purpose, it is necessary to form technical thinking in the future teacher first.

Technical thinking is understood as a set of intellectual processes and their results that provide solutions to problems of professional and technical activity (design and technological ones, during maintenance and repair of equipment, etc.) (Zalyrian 1988).

T. V. Kudryavtsev proposed the structure of technical thinking in the monograph "Psychology of technical thinking" (Kudryavtsev 1975). Analyzing the protocols for solving technical problems, products of activity and results of observations, the author of the monograph revealed that technical thinking is "three-component" in its psychological structure: "it is a conceptual-figurative-practical thinking" (Kudryavtsev 1975). T. V. Kudryavtsev explains the content of each component. The *conceptual component* should ensure the formation of technical concepts; *figurative* one should help to visualize complex systems of images and the ability to operate it; *practical* one involves mandatory verification of the solution by practice. "Theoretical (conceptual), figurative (visual) and practical (effective) components are not only interrelated (which is also the case in other types of activity), but also inter-operative, and each of the components acts as an equal member of the trinity" (Kudryavtsev 1975). The lack of any component of technical thinking in an individual is reflected in the solution of the corresponding tasks.

In the decades that have passed since the study of T. V. Kudryavtsev, technology has made a huge leap in its development—technical progress has led to a new level of relations between society and technology. In the late XX—early XXI centuries, scientists and engineers made thousands of important discoveries that changed the world fundamentally.

Today robots and automatic systems are no longer "inventions" of science fiction, but the reality. Animalistic robots and even cybernetic mechanisms with human

appearance that have a sort of artificial intelligence and can comprehend simple tasks have already been created. In the near future, scientists plan to create robots that are programmed to perform various security, agricultural and household tasks.

Smart home system is a huge gift to humanity, which allows one to control all the parts remotely using a computer. TV, refrigerator, household appliances, car, air conditioning system and other household items are automated today.

Moreover, the progress of technology is truly frantic. New computer equipment and components are of high quality and replace each other so rapidly that, as soon as they appear on the market, they begin to become obsolete.

Following new scientific discoveries and trends, new industries have emerged: microelectronics, cybernetics, robotics, nanotechnology, biotechnology, space, nuclear, microbiological industries, and others.

After analyzing the current situation, we found it necessary to improve the psychological structure of technical thinking (Matyash 2012). Using the methods used by T. V. Kudryavtsev, we came to the conclusion that it is advisable to introduce two more components into the proposed structure of technical thinking: technical language command and efficiency. We will define the content of each.

Technical language command is necessary for the use of drawings, diagrams, flowcharts, graphs, etc. Apparently, the technical language did not used to be considered as a component of technical thinking because it was enough to expand the natural language with technical terms and concepts. But today, the amount of technical information available to a person is so large that it is advisable to distinguish the language of technology as an independent language. The authors of the monograph "Philosophy of science and technology" (Stepin et al. 1995) emphasize that although science uses natural language, it can not only describe and study its objects on its basis. In addition, "The development of a special language by science that is suitable for describing objects that are unusual from the point of view of common sense is a necessary condition for scientific research. The language of science is constantly evolving as it penetrates into new areas of the real world. Moreover, it has the opposite effect on everyday natural language (Stepin et al. 1995).

The peculiarity of technical objects is that they must have descriptions that allow specialists to reproduce the necessary objects and ensure their use. In addition, technical tasks are often given in the form of symbols, and information in this specific form must be "re-encoded". Therefore, the solution of many technical problems requires the knowledge of the technical language (Smirnov et al. 2019).

As the second component of technical thinking, we distinguish *efficiency*—"the ability to correct or direct the course of affairs quickly and timely" (Ozhegov 1991). Operational thinking helps a person at the current pace of life to solve problems that require a quick analysis of a number of possible solutions and choosing the optimal option from them in limited periods. Such tasks are often encountered when working with technical objects.

The next step was to create a learning technology focused on developing technical thinking. We have developed a system of cognitive tasks. When creating the task system, we used elements of approaches known in the literature (Kleshcheva 2019; Molodtsova et al. 2019; Nikiforov 2019; Podymova and Dubitskaya 2018; Revunov

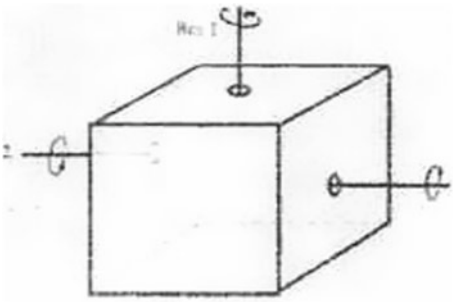

Fig. 1 Example of a task aimed at forming the components of technical thinking. *Source* Developed and compiled by the authors

et al. 2019; Vaganova 2019a, b). The created system of tasks for technical thinking development must meet certain principles.

1. As a rule, the authors of task systems emphasize the principle of gradual increasing the task complexity, so this is the first principle in our task system.
2. Above, when considering technical thinking, we proved that the structure of technical thinking has five main components: conceptual, figurative, practical, operational, and technical language proficiency. Therefore, the second principle is that the task system should include tasks for the development of all selected components.
3. The third principle in the task system is the focus on modern problems of technology.

Here is an example of the task aimed at forming the components of technical thinking: "The drive shaft 1 rotates in the direction indicated by the arrow. Shafts 2 and 3 are on different axes. It is necessary to design such a transmission to make the shafts 2 and 3 rotate in the specified directions and at different angular speeds" (see Fig. 1).

This task contributes to the development of two components of technical thinking: figurative and technical language skills.

At Nizhny Novgorod State Teacher-training University named after Kozma Minin conducted an experiment for several years to develop technical thinking among students based on the proposed technology, more than 150 people participated (Filchenkova 2019).

Control and experimental groups were formed. The results of experimental work were tracked using a specially developed diagnostic technique. The diagnostic method is a test that is evaluated on a 9-point scale (Gruzdeva and Smirnova 2018; Odintsova 2018; Smirnova and Krasikova 2018; Smirnova et al. 2017; Yumatova 2017). The diagnostic results are shown in Table 1.

The obtained results indicate that the process of technical thinking development was more effective in the experimental groups.

At the first stage, the indicators in the control group increased by 22.5%, and in the experimental group by 67.3% (Fig. 2).

Table 1 Changes in the level of students' technical thinking development

Research stages	Level of technical thinking development			
	Control group		Experimental group	
	Before the training using the technology	After the training using the technology	Before the training using the technology	After the training using the technology
Stage 1	4.6	5.9	4.7	8.2
Stage 2	4.8	6.0	4.8	8.4
Stage 3	4.8	6.1	4.5	8.5

Source Developed and compiled by the authors

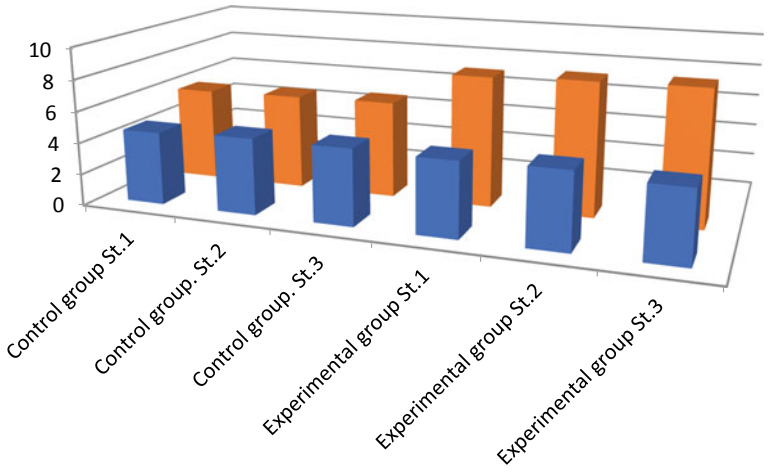

Fig. 2 Indicators of the control and experimental group. *Source* Developed and compiled by the authors

At the second stage, they increased by 22.6% in the control group, and by 69.5% in the experimental group. At the third stage, they increased by 28.2% in the control group, and by 89.3% in the experimental group.

4 Conclusion

The study of technical thinking structure allowed us to identify five components in it. This helped to create a simple and convenient technology for technical thinking development, which can be successfully used by every teacher. Its wide application, in our opinion, will contribute to the growth of technical literacy of students and future engineers, which in turn will affect the competitive ability of the state and will be the basis for technological and economic independence.

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Technologies for Assessing the Level of Socio-psychological Well-Being of Students Studying in Inclusive Groups at the University

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Abstract Definition of the current situation to establish an environment conducive to the social and psychological well-being of students of inclusive groups. Monitoring of the socio-psychological well-being of students studying in inclusive groups at the network of Resource Training and Methodological Centers for people with disabilities and, the RTMC of Minin University. An analysis of the psychological and pedagogical literature allows us to state that at present, the study of the socio-psychological well-being of students as an aspect of the problem of inclusive education in higher education is not sufficiently developed and is mainly addressed in studies on related topics and does not become the subject of special study. The article analyzes the study of student group training, in which students with a healthy standard and students with disabilities who need special educational conditions are trained together. This situation made it possible to focus on the socio-psychological well-being of students. Based on the results of the monitoring of the socio-psychological well-being of students in inclusive groups, a quantitative and qualitative analysis of the results is given. It is also concluded that it is necessary to form a situation of personality development and its parameters that are significant for personal and professional development—positive self-attitude, emotional stability, achievement motivation, and psychological competence in relationships.

Keywords Inclusive education · Socio-psychological well-being · Resource training center

JEL Codes I20 · I21 · I26

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1 Introduction

Most domestic and foreign scientists note that the socio-psychological situation in an educational institution is an important aspect of an inclusive educational environment (Akhmetzyanova et al. 2015). Of great importance is the nature of the relationship between students with disabilities and teachers, other students, managers, and all staff of the educational organization. The psychological pressure often experienced by people with disabilities makes it difficult to get a quality education and successful adaptation in the professional community, which may be aggravated by the immaturity of other students. The legacy of a long period of segregation inevitably affects the relationship between the subjects of education, so the problem is the need to create "psychological accessibility". In other words to create a generally positive attitude and friendly atmosphere for students with disabilities. As noted by Koreneva V. O., Chernysheva N. S., Akimova O. I. for the effective implementation of inclusive education, students with disabilities need an intellectual and psychological readiness for the educational process. In order to do that other students need a willingness to help, show understanding and tolerance (Koreneva et al. 2016).

2 Materials and Method

Intensive introduction of inclusive education in our country on all educational levels, including in the system of higher education actualizes the task of forming inclusive culture inclusive university education. This implies the creation of conditions in the university that ensure the social and psychological well-being of both students with disabilities and students with a standard of health. It should be noted that the concept of "socio-psychological well-being" is currently under discussion in the psychological and pedagogical literature. However, the general semantic load to determine this definition is expressed in the comprehensive functioning of a person in society, high vitality and resistance to life difficulties, self-actualization and autonomy of the individual. An analysis of the psychological and pedagogical literature allows us to state that at present, the study of the socio-psychological well-being of students as an aspect of the problem of inclusive education in higher education is not sufficiently developed. This problem is mainly affected in studies of related subjects, and does not become the subject of special study (Kantor and Project 2019). As a result the lack of research on the problem of psychological and pedagogical well-being. Data on the current situation in universities are presented in rather fragmentary terms regarding the creation of conditions that provide social and psychological support to students of inclusive groups. Conditions for implying the content definition and direction of work to accompany students in inclusive groups are not fully studied.

This study is also based on works such as Vaganova et al. (2019) and Rudenko et al. (2019).

3 Results

In order to determine the current situation for universities to create conditions conducive to the socio-psychological well-being of students in inclusive groups in 2019, socio-psychological monitoring was carried out by a network of Resource Training and Methodological Centers for the training of people with disabilities, including the RTMC of Minin University.

The monitoring was attended by respondents of inclusive groups. An inclusive group in the framework of this study was a student group in which students with health standards and students with disabilities, who feel the need to create special educational conditions are trained. This type of group allowed focusing on the socio-psychological well-being of students who are objectively experiencing accompaniment (Gruzdeva and Tukenova 2019a).

In order to identify student groups for the study, data were collected for all-inclusive groups of the EO HE, which were included in the total sample for the study. Further, the specification of groups in which students with special educational needs are taught was carried out. It was such groups that were identified for the study. After determining the circle of respondents, a survey was organized in terminal classes.

The research mechanism consisted of filling in an online questionnaire by students of the entire group (both students with disabilities, as well as students with a healthy standard).

Based on the results of the monitoring the socio-psychological well-being of students in inclusive groups, a quantitative and qualitative analysis of the results of the study is given (Gruzdeva and Tukenova 2019b).

A number of questions related to the issues of the socio-demographic block ("passport": gender, age, course of study, subject of study, name of the university in which the respondent is studying, disability). Calculation of the numeric value was carried out on questions that involve the respondent's assessment of the following criteria:

- level of emotional well-being
- various aspects of the organization in the educational process:
  - comfort of the interior space and rooms, where classes take place;
  - class schedule, schedule of the educational process, the work of the dean's office, the opportunity to get consultations;
  - work of tutors and curators responsible for individual professional trajectory and educational work;
  - accessibility of the educational environment for students with disabilities, the availability of ramps, elevators, etc., as well as assistive special equipment.
- respondent's physical condition
- level of self-realization in the fields of science, design, social activity, culture, and sports
- presence of conditions in the organization created for the self-realization of students in science, design, social activities, cultural sphere, and in the field of sports

- level of socio-psychological climate in the group
- open and hidden conflicts in the group
- the need for additional support from a psychologist (Krasnopevtseva et al. 2020).

The calculation of the numeric value of the evaluation result was based on assigning quantitative values to the response variants. Each version of the answer had a quantitative point value:

- equal to 4 points, which means a favorable effect of the indicator/condition on the socio-psychological well-being of a student studying in an inclusive group;
- equal to 3 points, which means a less pronounced indicator/condition on the socio-psychological well-being of a student studying in an inclusive group;
- equal to 2 points, which means that the influence of the indicator/condition is rather not favorable for the socio-psychological well-being of a student studying in an inclusive group;
- equal to 1, which means the adverse effect of the indicator/condition on the socio-psychological well-being of a student studying in an inclusive group.

As a result, the maximum value (upper limit) equal to 80 conditional points was obtained. Based on this, the assessment of socio-psychological well-being had 3 levels: low, medium, high level of subjective socio-psychological well-being (Krasnopevtseva et al. 2019).

- The resulting value ($\sum$), which is in the range of 20–40, was regarded as a low level of socio-psychological well-being of students in inclusive groups;
- The resulting value ($\sum$), ranging from 41 to 60, was regarded as the average level of socio-psychological well-being of students in inclusive groups;
- The resulting value ($\sum$), ranging from 61 to 80, was regarded as a high level of socio-psychological well-being of students in inclusive groups.

A number of questions had qualitative characteristics and included assessing the conditions created in the organization for a healthy lifestyle for students. It is reflecting their own position to create mixed groups of students with normal health and students with disabilities at the university, as well as the possibility of changing the choice of education in an inclusive group at the admission stage (Smirnova et al. 2019, 2020a, b).

A total of 3306 students from inclusive groups of EO HEs from 32 universities of the Nizhny Novgorod, Penza, Samara, Saratov, Ulyanovsk, Perm regions, and the Republic of Mordovia took part in the study conducted by the RTMC of Minin University. Of the total number of respondents, 216 people (7%) have a disability, 3,090 people (93%) have a health standard. Participants of the study were respondents of different nosological groups: with impaired vision function—4%, with impaired hearing function—1%, with impaired musculoskeletal function—6%, with other diseases—89% (Table 1).

Based on a quantitative analysis of the assessment of indicators of socio-psychological well-being by students with disabilities and health standards, we can conclude that between students with disabilities and students with health standards

Table 1 Assessment of indicators of socio-psychological well-being by students with disabilities and with health standards

Indicators	Students with a standard of health (number of answers (abs./specific weight))				Students with disabilities (number of answers (abs./specific weight))			
	4 points	3 points	2 points	1 point	4 points	3 points	2 points	1 point
Assessment of emotional well-being	1581	857	388	264	131	44	21	20
	51%	28%	13%	9%	61%	20%	10%	9%
Assessment of the organization of educational process								
Comfort of indoor space and rooms where classes take place (auditoriums, corridors, foyer, toilets, computer and laboratory equipment	948	1557	471	114	103	95	16	2
	31%	50%	15%	4%	48%	44%	7%	1%
Schedule of classes, schedule of the educational process, work of the dean's office, opportunity to get consultations	1053	1481	428	128	99	101	11	5
	34%	48%	14%	4%	46%	47%	5%	2%
Work of tutors and curator responsible for individual professional trajectory and educational work	1254	1354	328	154	114	81	18	3
	41%	44%	11%	5%	53%	38%	8%	1%
Accessibility of the educational environment for students with disabilities, the availability of ramps, elevators, etc., as well as assistive special equipment	964	1379	495	252	89	87	29	11
	31%	45%	16%	8%	41%	40%	13%	5%

(continued)

Table 1 (continued)

Indicators	Students with a standard of health (number of answers (abs./specific weight))				Students with disabilities (number of answers (abs./specific weight))			
	4 points	3 points	2 points	1 point	4 points	3 points	2 points	1 point
Assessment of the level of your physical condition	1228	1421	402	39	56	130	20	10
	40%	46%	13%	1%	26%	60%	9%	5%
Assessment of the degree of self-realization in the following areas								
Science	902	1131	752	305	79	72	46	19
	29%	37%	24%	10%	37%	33%	21%	9%
Design	883	987	770	450	65	77	52	22
	29%	32%	25%	15%	30%	36%	24%	10%
Social activity	1177	736	699	478	83	66	39	28
	38%	24%	23%	15%	38%	31%	18%	13%
Culture	1106	911	680	393	80	75	42	19
	36%	29%	22%	13%	37%	35%	19%	9%
Sport	1050	663	710	667	60	45	50	61
	34%	21%	23%	22%	28%	21%	23%	28%
Assessment of conditions created for self-realization of students at the university in the following areas								
In science (research, conferences, articles, etc.)	1180	1574	269	67	100	105	10	1
	38%	51%	9%	2%	46%	49%	5%	0%

(continued)

Table 1 (continued)

Indicators	Students with a standard of health (number of answers (abs./specific weight))				Students with disabilities (number of answers (abs./specific weight))			
	4 points	3 points	2 points	1 point	4 points	3 points	2 points	1 point
In design	975	1623	374	118	84	115	14	3
	32%	53%	12%	4%	39%	53%	6%	1%
In social activities (youth activity, volunteering, etc.)	1647	1240	152	51	128	77	10	1
	53%	40%	5%	2%	59%	36%	5%	0%
In the cultural sphere (creative studios, participation in cultural events, etc.)	1408	1363	239	80	110	88	17	1
	46%	44%	8%	3%	51%	41%	8%	0%
In the field of sports (sections, participation in competitions, etc.)	1481	1323	211	75	112	90	9	5
	48%	43%	7%	2%	52%	42%	4%	2%
Assessment of socio-psychological climate in student group (assessment of learning comfort in group)	1717	1143	186	44	142	59	14	1
	56%	37%	6%	1%	66%	27%	6%	0%
Assessment of conflicts in the student group (open and hidden)	1080	1260	651	99	79	104	32	1
	35%	41%	21%	3%	37%	48%	15%	0%
The need for additional psychologist support	1844	509	527	210	132	43	27	14
	60%	16%	17%	7%	61%	20%	13%	6%
Assessing your student life as a whole	1163	1548	277	102	106	95	9	6
	38%	50%	9%	3%	49%	44%	4%	3%

Source Developed and compiled by the authors

there are no fundamental differences in the parameters of socio-psychological well-being, which indicates that they experience the same or similar problems (Markova et al. 2020).

Calculation of the numerical value of results in the study is performed in accordance with the criteria laid down in the questionnaire. Calculation of the level of socio-psychological well-being of students was carried out according to the total sample of respondents. The level was presented separately for respondents with disabilities, as well as for respondents with normal health, and also for specific subjects of the Russian Federation (Figs. 1 and 2).

The results of the study, reflecting qualitative characteristics, showed that most of the respondents of inclusive groups (both those with disabilities and those with health standards) are satisfied with the conditions for a healthy lifestyle created in universities (88% and 79% respectively). The maximum number of respondents expressed the position that they did not change their decision to study in an inclusive group at the stage of admission (94%—respondents with disabilities, 87%—respondents with normal health). In general, respondents are satisfied with their student life (93% are respondents with a disability and 88% are respondents with a good health).

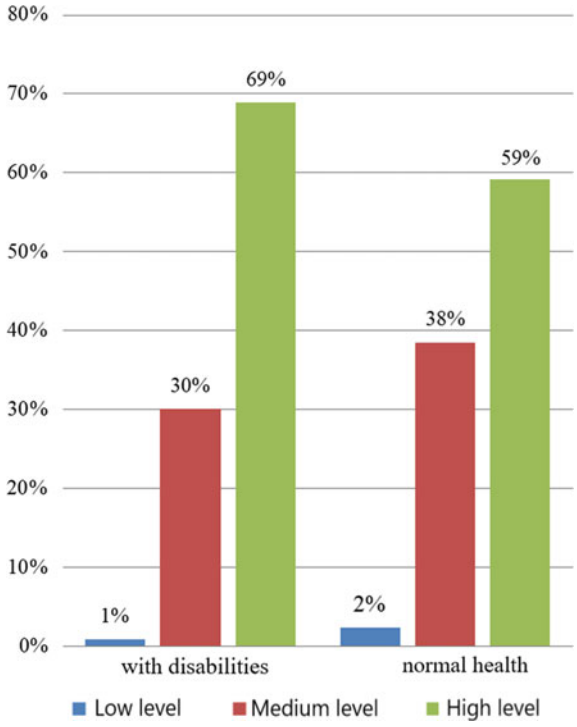

Fig. 1 Distribution of respondents by levels of subjective socio-psychological well-being. *Source* Developed and compiled by the authors

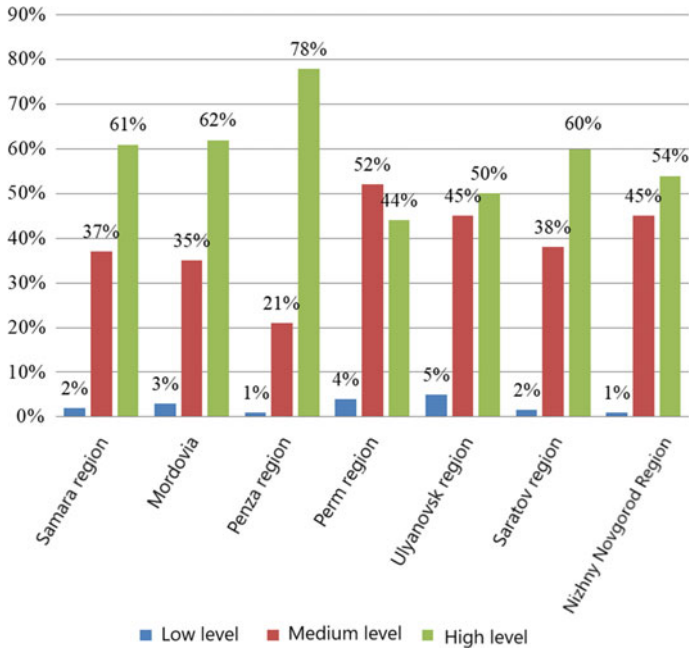

Fig. 2 Distribution of respondents according to the levels of subjective socio-psychological well-being (by subjects of the Russian Federation). *Source* Developed and compiled by the authors

4 Conclusion

Based on the results of monitoring the socio-psychological well-being of students, we can state the following:

(1) In the vast majority of universities involved in monitoring, purposeful and systematic work is underway to form the socio-psychological well-being of students, including students of inclusive groups;
(2) There is sufficient provision of activities of higher education institutions in the formation of social and psychological well-being of students, including students of inclusive groups at the levels of the educational process, extracurricular, and leisure activities;
(3) The majority of students in inclusive groups are ready for coeducation and welcome learning in such groups.

In general, in order to increase indicators according to the criteria of social and psychological well-being, in our opinion, it will be advisable to additionally train scientific and pedagogical workers of universities, psychologists, social educators, and other categories of workers in the field of socio-psychological support. It should be noted that accompaniment should be holistic, system-organized, during which socio-psychological and pedagogical conditions should be created for successful

development, and adoption by the development subject of optimal decisions in various situations of life or professional choice (Sedykh et al. 2019).

For the formation of socio-psychological well-being of students of inclusive groups, the subjects of the educational process are recommended to use the following activities:

(1) Systemically organized activities of a psychologist, teachers and university administration, curators of student groups, etc., during which social, psychological and pedagogical conditions are created for successful learning, psychological development of students studying at a university with disabilities;
(2) Activity of specialists aimed at the study, development, and correction of personal development of a student with disability, their socio-psychological adaptation, professional formation through psychodiagnostic procedures, counseling to resolve problems and difficulties, psychoprophylaxis and information assistance.

The socio-psychological well-being of students is directly related to the psychological and pedagogical support of the educational process for persons with disabilities. It is also connected to the structure of the educational process and determined by its goals, construction, content and methods. It is necessary to provide assistance in overcoming difficulties in learning in the context of educational integration, successful development, social and psychological adaptation, self-realization, strengthening health, and protecting the rights of students.

It is necessary to monitor the schedule of the educational process and performance of certification activities, psychological counseling, organization of individual consultations, individual training plans and individual training schedules, provision of educational and methodical materials.

Formation of socio-psychological well-being of students depends on ensuring optimal professional and personal development of students with disabilities, successful integration into society, development effective life strategies (forms of purposeful organization by a person of their own life, including their attitude to their own opportunities and resources, their actualization and realization). It is also necessary to formulate situations of personality development and its parameters that are significant for personal and professional development—positive self-attitude, emotional stability, achievement motivation, goal-setting skills, and psychological competence in relationships.

In order to ensure the possibility of forming the socio-psychological well-being of students, it is necessary to take into account the pedagogical component, which covers a wide range of assistance in the learning process: monitoring of academic achievements, correction of gaps; advising students with disabilities; involvement of students with disabilities in extra-curricular and leisure activities; counseling teachers on the selection of individually-oriented methods and techniques for working with students with disabilities.

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The Role of Interactive Technologies in the Formation of Professional Competencies of Students in the Era of Intelligent Machines

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Abstract The relevance of the topic is due to the constant increase in the requirements that employers place on the quality of knowledge and professional skills of graduates with engineering specialties. Graduates of universities should have a good knowledge of professional competencies, that is, to successfully solve problems in the professional field. An important place in the study of modern education is the question of changing the structure of the professional activity of graduates with engineering specialties and the methodology of their training. The aim of the study is to identify trends and tools to improve the efficiency and quality of education for students with engineering specialties during practice-oriented training in the context of FSES HE 3++. Scientific novelty of the work consists in substantiating the effectiveness of the use of interactive technologies in practice-oriented training of engineering students to improve the quality of education according to the federal state educational standard (FSES HE 3++). In the article, the authors used the following methods: praximetric (study of normative documentation—curricula, programs and results of students activity); theoretical (study of pedagogical, methodical literature, and other documents). The results of the study confirm the effectiveness of interactive technologies for the formation of professional competencies among students of engineering specialties as a result of practice-oriented training and can be used to organize the educational process for students of such specialties. Also, the authors conducted an analytical review of the cost of intelligent interactive devices used in education, as well as highlighted their advantages. The successful development of professional competencies requires integration into the educational process of research and practice, which should be systemic. As a result of practice-oriented training should be a comprehensive formation in students of engineering specialties of conscious motivation and professional competencies. The article substantiates the effectiveness of the application of interactive technologies to improve the quality of educational activities with FSES HE 3++.

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1 Introduction

A characteristic feature of modern education is the increasingly active use of environmental opportunities to achieve educational goals (Prokhorova and Vaganova 2019).

Currently, there is a large gap between the requirements of employers and the quality of training for young specialists at Russian institutions of higher education in terms of formation holistic, and integral-system thinking (Samerhanova 2019).

At present in the Russian Federation in the post-Soviet space, in the context of global competition with often limited funding, one of the main criteria for the viability of educational institutions are the quality of their educational services (Samerkhanova et al. 2020a).

The principle of personal interest of students, laid down in the method of projects by its founders J. Dewey and V. X. Kilpatrick, allows us to talk about the conditions for the formation of professional competencies within the educational process (Samerkhanova et al. 2020b).

The relevance of the stated topic is also due to the fact that since September 2019, Russian universities have been massively moving to the new federal state educational standard (FSES HE 3++). In this regard, there are some difficulties in implementing the curriculum, since FSES HE 3++ has some differences from the previous FSES HE 3+, for example: credits for one academic year have been increased from 60 to "no more than 70" in full-time education; the field of professional activity is defined in accordance with the register of professional standards (previously determined for each area of training); the bachelor must have universal competencies (previously it was a question of general cultural competencies); professional competencies are formed on the basis of professional standards, can be established by the educational program as mandatory and (or) recommended (earlier—the bachelor should have professional competencies corresponding to the type (s) of professional activity).

One of the tools for obtaining high-quality knowledge by university students, as well as the acquisition of practical skills by them, are intelligent teaching systems (Tuomi 2018).

Intelligent learning systems include interactive learning tools, including:

(1) interactive training kit (for example, textbooks, reference books, trainers, laboratory workshop);
(2) interactive equipment (e.g. whiteboard, tablet, projectors, test systems, plasma panel).

Some of these interactive learning tools are used at the University of Minin University in the preparation of specialists in the Bachelor's Degree Program "Applied

Informatics in Management" (direction of preparation 09.03.03 "Applied Informatics") and the bachelor's program "Information Systems and Technologies" (direction of training 09.03.02 "Information systems and technologies") in accordance with the Federal State Standard HE 3++.

2 Materials and Method

In the course of writing the article the following methods were used:

- praximetric (the study of local regulatory documentation—curricula, programs and results of student's activity). Federal state educational standards (FSES HE 3+ and FSES HE 3++) in the direction of preparation 09.03.03 "Applied Informatics" and the direction of preparation 09.03.02 "Information Systems and Technologies" were considered;
- theoretical (the study of pedagogical literature, scientific articles and other documents). The works of domestic authors were analyzed: Artyukhina M. S.; Vyatkina I. V.; Khramtsovoy E. O. and Bochkareva P. V., Samerkhanova E. K. et al.; Prokhorova M. P. and Vaganova O. I., as well as the work of foreign authors: Shengli Chen; Tuomi I.; Abykanova B. et al.

3 Results

In connection with the high demands of the labor market for the quality of knowledge of graduates, higher education institutions are faced with the task of forming graduates with professional competencies that allow them to easily find work in their specialty after graduation.

A graduate of a higher educational institution should be prepared for professional activity, that is, capable of solving practical professional problems on the basis of obtained fundamental knowledge (Abykanova et al. 2017). An irreplaceable assistant in this situation are intelligent training systems, that is, automated systems with an interactive interface that can conduct a dialogue with the user.

Intelligent learning systems can solve various types of problems. Below in Fig. 1, groups of such systems are presented, depending on what tasks they solve (Khramtsova and Bochkarev 2017).

To determine the degree of assimilation of material by students, it is rational to use interactive teaching methods.

On the basis of the University of Minin University, the opportunity was realized to monitor the quality of assimilation of material by students in the Moodle electronic educational environment throughout the entire study of the discipline. The teacher can place a test for entrance control in his discipline, aimed at identifying the initial level of knowledge of students. During the course of training it is assumed that students have to carry out current control after studying each topic (solves control works,

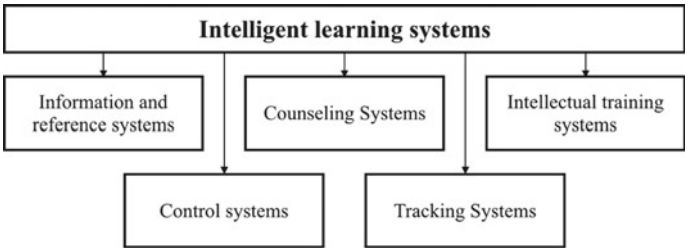

Fig. 1 Groups of intelligent learning systems. *Source* Compiled by the authors

perform laboratory, practical and independent works, pass test tasks). The teacher in real time can remotely evaluate the work performed and obtain information on the degree of development of the material by a particular student. Based on this, if necessary, it is possible to correct, for example, further lecture classes, focusing on topics poorly mastered by students.

The use of interactive technologies in the educational process helps to increase the motivation of students to study a particular discipline, a problematic topic, and active participation in educational and cognitive activities. The deeper the student is involved in the educational process and the higher his interest in acquiring and mastering new knowledge and skills, the greater the degree of student satisfaction with the educational process.

Table 1 shows the prices of interactive devices that can be used in the educational process.

Among students of the University of Minin University who are studying in the field of training 09.03.03 "Applied Informatics", a questionnaire was conducted on the topic of satisfaction with the educational process, namely the teaching methods.

Most students are satisfied with the quality and methods of presenting the material, as well as with the conditions and technical equipment of practical and lecture classes.

Eighty percent of the students who took part in the survey said that they were generally satisfied with the methods of teaching subjects.

Seventy-five percent of respondents said that they like to attend classes in which teachers use active and interactive teaching methods. A similar number of respondents agreed that the use of active and interactive technologies in the classroom contributed to a faster and deeper learning of the material and the consolidation of the practical skills.

Student satisfaction with learning and the quality of education are interlinked and directly depend on the material and technical equipment of the educational process and the application of interactive forms and methods of teaching. The latter in turn depends on the availability of interactive technology interactive board, projector, plasma panel, etc.

To train students in engineering specialties ("Applied Informatics in Management" and "Information Systems and Technologies") at the Minin University, a project-oriented approach is used.

Table 1 Cost and benefits of using interactive devices (according to Yandex Market, February 2020)

Name of the interactive device	Price (min.–max.), rub	Advantages
Digital microscope	988–249,990	When connected to a computer, it allows you to get an enlarged image of the studied object on the monitor screen or on a large screen using a remote projection device connected to the computer
Document camera for zooming in and showing on screen	10,900–2,434,875	The ability to demonstrate in the smallest details of an item of any type without prior preparation (creating slides, films, determining the order of the show, etc.)
3D scanner	20,990–1,180,000	High scanning speed, ability to design products when needed to add missing parts
Interactive board	26,490–429,100	The ability to prepare training material in advance; play audio, video files or entire web pages
Interactive kiosk	56,000–530,000	Placing an interactive schedule; document libraries, databases; media materials, etc.

Source Compiled by the authors

An effective way to implement project-oriented training in engineering specialties is to perform laboratory work by students. This method allows students to generate interest in practical activities, the ability to use scientific knowledge as a methodological, experimental and technological means of professional activity (Shukshinaa et al. 2016).

To implement the project-oriented approach, the following steps are required: Stage 1 (preparatory)—tell students about the specifics of the project activity and its significance in educational and professional activities; 2nd stage (individual)—to enable students to work individually as part of their project assignment. At this stage, students should realize themselves and comprehend the need to obtain the professional knowledge necessary for further career growth; 3rd stage (group)—teach students to work in a team, perform group work, bear collective responsibility for the result of project activities (Fig. 2).

In the course of laboratory work, students of engineering specialties can use interactive teaching means that, when used systemically, will help students adapt to real working conditions (Artyukhina 2014).

During the training, students must master the theoretical material; professionally-oriented skills; get motivation for professional activity (Vyatkina 2019).

The main factor in achieving high-quality training of graduates is the continuity of methods and ways of organizing the educational process from elementary to

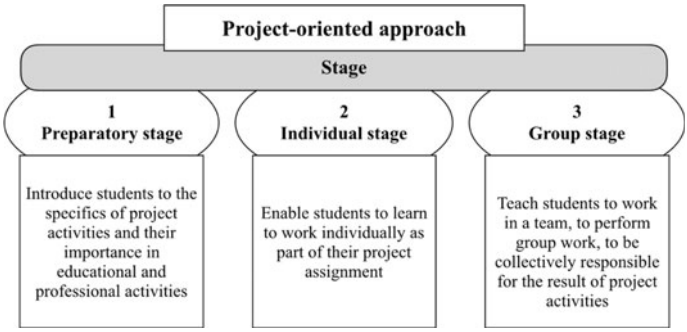

Fig. 2 Stages of the project-oriented approach. *Source* Compiled by the authors

senior courses, from mastering universal competencies to professional ones, from theoretical to practical classes (Chen 2017).

Practice-oriented training is aimed at developing self-education, a creative approach and solving professional problems, the relationship of theory and practice. After graduation, the graduate will consciously strive for further self-education and improvement of his knowledge in the professional field. Thus, practical work is an important link in the process of formation of a competitive graduate of an engineering specialty.

4 Conclusion

For a productive development of professional competencies, the authors consider it necessary to consider project-oriented activities as a system that provides interactive feedback, such as continuous participation of students in solving professional practical problems during the entire period of study.

The authors came to the conclusion that the result of practice-oriented training in higher education institution is the complex formation of conscious motivations among students of engineering specialties and professional competences. Moreover, the quality of knowledge acquired by students is closely related to the degree of satisfaction with the conditions of the educational process. One of the ways to ensure a comfortable, favorable and stimulating learning environment is through integration and the use of interactive learning tools in the educational process.

The conducted survey among the students of the Minin University confirms the theory of increasing their motivation in the educational process, if the teacher uses interactive means of learning.

Thus, we can talk about the effectiveness of the use of interactive technologies to improve the quality of educational activities of students with Federal State Educational Standard 3++.

The new Federal State Standard of Higher Education 3++ is aimed at increasing and strengthening the role of employers involved in the development of a professional educational program, thereby reducing the gap of "employer-university". This approach will provide such a level of training for graduates that will allow them to quickly adapt to real working conditions.

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Creation of the Socio-educational Landscape of the University with a New Paradigm of Socio-economic Development

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Abstract To study the problem of creating a socio-educational environment of a modern university as a social phenomenon and a functional-spatial construct of the pedagogical space. Creating a typology of educational spaces. Determination of the level of demand among students and teachers of innovative educational spaces. Consideration of methods and technologies for their effective use. Traditional approaches and new possibilities of organization of educational space consisting of design solutions for modern educational space, theoretical and methodical provision of project-oriented training on the example of implementation of the project "Creation of social and educational landscape of Minin University". Aspects of the socio-educational space are highlighted, and a typology of educational spaces is presented. The survey results obtained during the pedagogical experiment on the basis of the University of Minin (Nizhny Novgorod, Russia), are reflecting the level of satisfaction with the created educational space. The results of methodological developments on the use of educational spaces in the educational process on the example of open educational spaces and collaborative learning studio are presented. Needless to say, the prospects of the study are determined, which consisting in analyzing the impact of innovative educational spaces on the quality of training of future teachers. Scientific novelty consists in the development of typology of innovative educational spaces, as well as the proposed set of forms and methods of conducting classes in innovative educational spaces. Areas of interest are the results of a survey of students and teachers.

Keywords Professional educational · Educational space · Educational landscape · Spatial-subject component · Open educational space · Collaborative learning studio

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1 Introduction

A new paradigm of the socio-educational development of society in the era of intelligent machines fundamentally changes the organization of the educational process at the university. Forms and methods of organizing the educational process aimed at independent work of students with information resources, organization of design and creative activities come to the fore. Under these conditions, one of the resources for improving the quality of modern professional education is the creation of educational spaces that meet new requirements. The goal of this study is to consider the essence, structure, modern possibilities of modernization of the educational space of the university, which have been conducted on the basis of the FSBEI HE NGPU named after K. Minin (University of Minin). We build the logic of our study from the assumption that the formation process of a future professional will be more effective if the object and spatial component is modernized. Educational space that creates conditions for motivation to self-educational activity, personal and professional growth of students and teachers, increase the level of satisfaction from educational process. At the first stage contradictions were identified between the need of participants to use available, variable, high-tech, multifunctional educational spaces and insufficient study of the problem of their design, creation and use in the educational process.

2 Materials and Method

The need for theoretical substantiation of the possibilities and prospects of using the modernized space required understanding of a number of concepts "educational space", "educational environment", "educational landscape", and "subject-spatial component".

The term "educational landscape", which has become part of pedagogical practice relatively recently, is a "semantic metaphor" caused to live, according to the opinion of the Gerasimov (2014). So, failure of traditional means to reflect the value of a topological nature in the cognitive-developmental paradigm of educational content, one of the methodological principles on which educational space is constructed.

The term "educational space" is used with various content: it is an educational complex, educational space of individual educational institutions (Sinyakova 2015), the space of conditions and opportunities of interpersonal interaction between subjects in the educational process (Kazakova 2011), personal educational space of the subject, a combination of institutional phenomena, subjective and intersubjective meanings (Voropaev and Tolkacheva 2017), the result of development by the subject of the environment (Karapulina 2014) and others. The essential characteristics of the

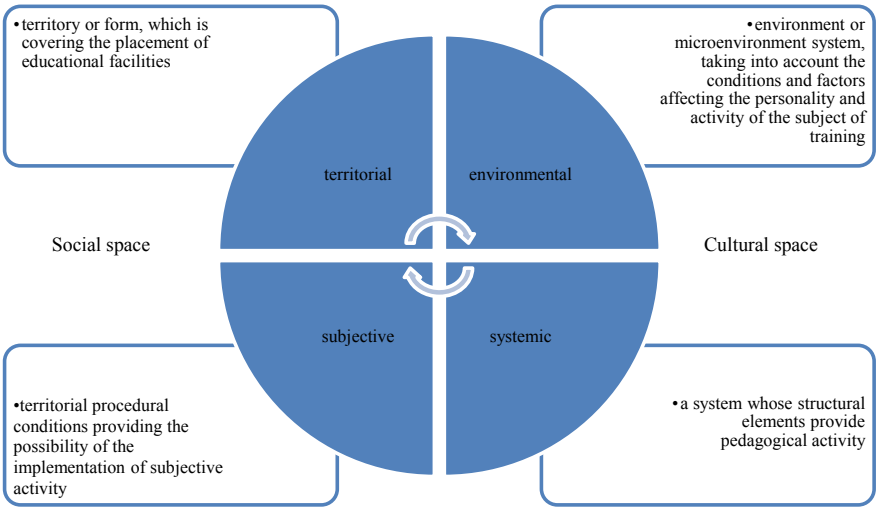

Fig. 1 Aspects of the educational space. *Source* Developed and compiled by the authors

educational space consist in the implementation of the space in pedagogical interaction (Leskova 2014). It reflects a certain educational extension, structural coexistence and interaction of any possible educational systems, their components, and educational events (Stenina 2011).

A number of aspects of the socio-educational space can be distinguished (Fig. 1).

Important in the description of the educational space we consider the addition of Voropaev and Tolkacheva (2017) and Lagunova (2011) of the information component which is reflecting volumes of information flows that determine functioning of the educational space.

The term "educational space" is not identical to "educational environment". From the point of view of the environmental approach, the environment is considered as a set of places that provide various opportunities for the subject, or as a condition, a set of components acting as agents of influence on the subject (Manuylov 2002).

Thus, the educational space of a modern university will be considered, along with the socio-pedagogical phenomenon, as a functional-spatial construct of the educational landscape, in which the professional formation and self-realization of the personality of both the student and the teacher is carried out (Tolsteneva et al. 2019a). In the context of this study, we pay special attention to the subject-spatial component of the educational space.

The subject-spatial component is a space designed to meet the cognitive needs of a person and includes planning-spatial, style, color, lighting and subject characteristics that affect the professional development of a student's personality (Shentsova 2019).

3 Results

Within the framework of the project "Creating the socio-educational landscape of the University of Minin", an innovative educational environment is being created. It is consisting out of design solutions of the modern educational space and organizational and methodological approaches of the effective use of educational spaces. The first stage of activity was the theoretical understanding of the basic principles of modernization in the educational space, which formed the basis of the project concept in the context of global trends (Fedorov et al. 2015) and the development strategy of the University of Minin (2015) (Development Strategy of NGPU 2023).

The next stage was a new design of the educational ecosystem of the university (Fedorov et al. 2018), based on a study of students and teachers attitude to the features of the modernized subject-spatial environment in accordance with the chosen concept based on the developed organizational and technological principles of the functional-spatial organization at Minin University:

- improvement of existing and the creation of additional multifunctional zones, providing opportunities for expanding the information environment of the university;
- expanding the range of premises, taking into account the different type of interaction between students and teachers, providing project-oriented training;
- ensuring the flexibility of planning and improving the technical equipment of various types of premises, the organization of information and communication;
- improving existing and creating new areas for independent work of students, additional recreational areas;
- taking into account the psychological aspects of the spatial organization of space.

As educational spaces, new types were emphasized, annotated in the publication (Tolsteneva et al. 2019a), in particular, open educational spaces, collaborative learning studios; zones of independent work of students; high-tech audiences; project audiences and several others.

In 2019, the University develops informative and programmatic support for the activities of teachers and students. Analysis of the attitude of students and teachers to the features of the modernized educational space of the university was carried out through questionnaires and interviews (92 students and 68 teachers were interviewed). The selected indicators for teachers and students were offered to evaluate on a scale of 1–5, 1- is weakly expressed, 5- is strongly expressed. The results of the survey are presented in Fig. 2.

The conducted survey of teachers showed a high need for the use of innovative educational spaces and at the same time not a sufficiently high level of methodical preparation for their use and development of methodical support.

The survey results of students participating in the project are presented in Fig. 3.

Students survey results showed that, according to students, the methodological capabilities of innovative educational spaces are not fully used (Smirnova et al. 2019), which requires a fairly deep methodological study of the use of educational

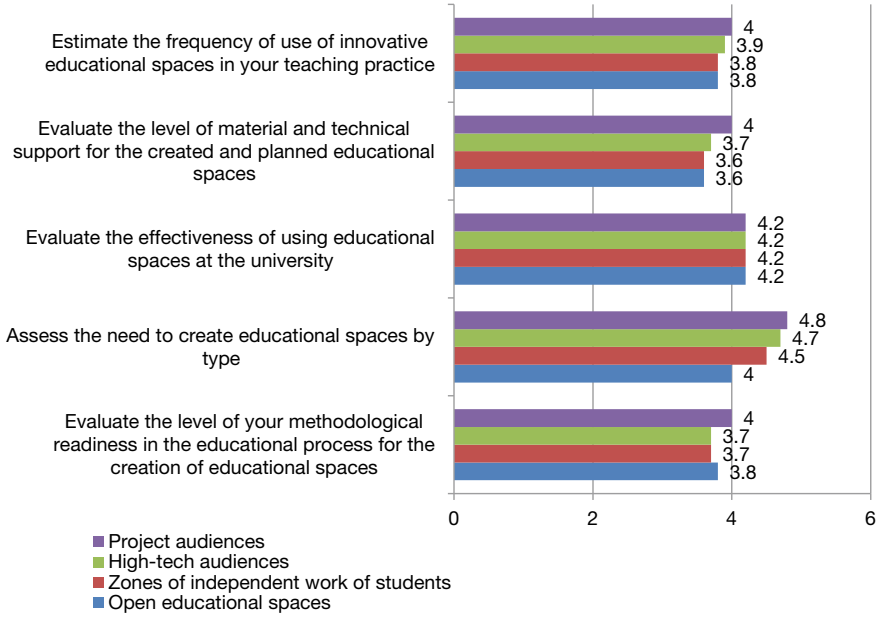

Fig. 2 Results of the teacher's attitude at the University of Minin to the features of the modernized educational space. *Source* Developed and compiled by the authors

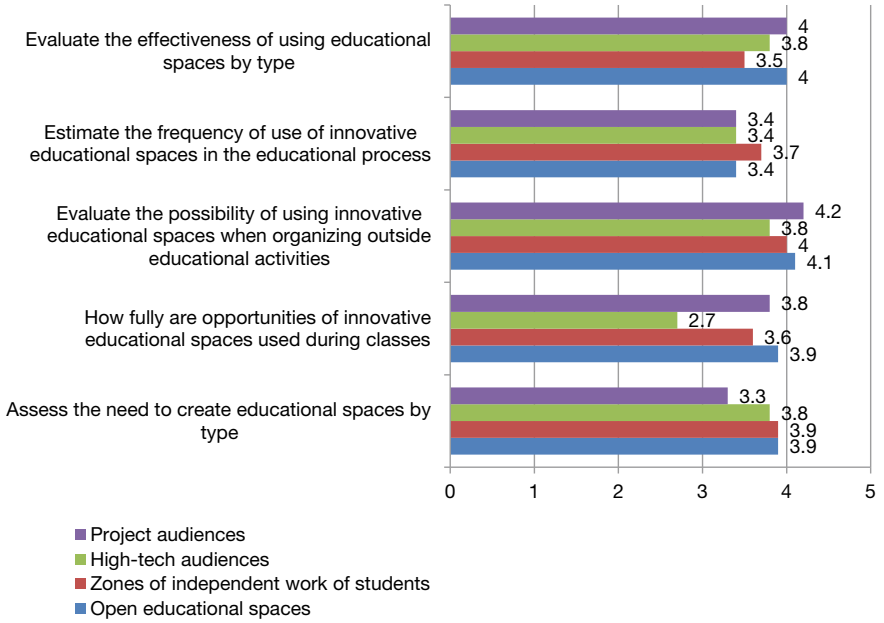

Fig. 3 Results of the student's attitude at the University of Minin to the features of the modernized educational space. *Source* Developed and compiled by the authors

spaces. Let us dwell in more detail on individual types of educational spaces and their capabilities.

A multifunctional open educational space (Ilyashenko et al. 2019). The uniqueness of the educational space is ensured by the possibility of free movement due to the absence of doors, several entrances and exits; ergonomic environment; maneuverability and mobility of furniture; modern multimedia equipment and software.

The Open Space technology is used in a very limited way: as a rule, to create intensive communication between people during self-organizing seminars focused on specific goals and a common topic. Participants are arranged in a circle or in several concentric circles, the teacher tells the general topic and principles of functioning in the open space, then the actions of the group are aimed at developing a work agenda. A "information board" is created, in which the meeting place and time of the working groups are assigned. Participants in the same seminar have the opportunity to participate in several working groups. The result of the work is a protocol that accumulates the main proposals, theses and arguments. Then all protocols are combined into a common document, replicated and provide access to it for each participant. The main purpose of the open space is the effective organization of working meetings of participants (Myalkina et al. 2018).

Modern formats of education in higher education require expansion of educational opportunities of application of open space technology, and its effective use (Sedykh 2019). Open space technology involves the creation of a special environment in the format of educational, research, information and communication, design, sociocultural platforms that allow students and teachers to effectively interact, freely and independently learn and implement the content of educational programs, using a wide range of educational technologies and tools (Fedorov et al. 2019).

Transformation of traditional educational space into an open space is associated with a number of organizational difficulties: orientation of the space on the specifics of humanitarian knowledge; possession of the teacher and student skills for work in this space; multitasking of the teacher's activities, which entails simultaneous involvement of several teachers; the need to apply didactic combinatorics in solving educational problems; the need to integrate educational technologies used in various fields of science and practice (corporate training, management, personnel management, etc.), the need to change the approach to the distribution of the workload and scheduling training sessions (Frolova et al. 2017). The experience of developing a technological map for mastering the discipline "Social Design" in the format of a training event has shown the effectiveness of incorporating the following educational technologies listed in Table 1.

In the context of pedagogical education, interest is the interactive studio of collaborative learning "SPIKER" (Synergy of pedagogical initiatives and creative solutions). Most experts define collaborative learning as learning in collaboration, the interaction of all subjects of the educational process in solving specific problems or creating a joint product (Frayssinhes 2011).

Table 1 The most effective teaching methods implemented in innovative educational spaces of the University of Minin

Open educational spaces	Student work areas	Collaborative learning studio	Project audiences
Brainstorm Business game Discussion Mind map Active learning Mutual learning Scrap booking Workshop Call cafe Foresight session Networking Coworking Balint session Bi-lecture Communicative training Quiz Basket Technology Feedback survey Ranking Reflective technology	Design technology Portfolio technology Case technology Problem learning technology Differentiated learning technology Technology of educational and gaming activities: • Didactic games • Role-playing games	Social design Pedagogical design Socio-pedagogical design Psychological design Psychological and pedagogical design Organizational and management design	Self-study activities Seminars Passing essays and term papers Research Game activity Interactive lectures, conferences, role-playing and business games Workshops within the framework of project teams Project passing Conferences

Source Developed and compiled by the authors

Studio space is multifunctional and includes information search and analytics area, decision making area, presentation zone. Each of them is equipped with multimedia technologies in accordance with functional requirements (monitors, interactive displays, personal computers, a conference system, a system of distributed access to information resources) (Tolsteneva et al. 2019b).

The software involves information decision support systems, including DSS class software products, ORACLE decision support system, Microsoft Project, Open Proj, Projekt Libre, Longitude software complex, designed to solve a wide range of educational, applicational and research tasks in areas of psychology, pedagogy, social work and others.

A qualitative change in the educational environment sets new possibilities: the emergence of new structures, an understanding of the relationships between subjects and the environment as a way of an event, a way of compatibility and unity, multivariance of the routes of "self-directed" development (personal and collective self-movement). The teacher in the mode of "soft management" acts as a partner or moderator of joint pedagogical search.

A methodological complex includes open, replenished data banks of pedagogical, socio-pedagogical, psychological-pedagogical, organizational and managerial (based on wiki-principles): problems, cases, solutions.

4 Conclusion

A distinctive feature of the modernized educational space of the University of Minin is the orientation of design solutions and methodological approaches to the use of educational space to increase student and teacher satisfaction from the educational process, creating conditions for motivation for self-educational activity, self-change, personal and professional growth of students and teachers.

The results show that both students and teachers with great enthusiasm diagnose new possibilities of premises, select forms and design new ways interaction, actively carry out educational and self-educational activities, build trajectories of professional formation. Scientific novelty of the presented research consists in the development of typology and proposed by the authors forms and methods of teaching classes in educational spaces. The results of the survey of teachers and students are also of interest.

Further development of the educational space will significantly improve the training of future graduates, create conditions for increasing the professional competence of students in order to form a new pedagogical position and create a need for the development of personality-oriented pedagogical technologies.

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Artificial Intelligence as a Factor in Labor Productivity

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Abstract The main purpose of this article is to study of the impact of the development of artificial intelligence on labor productivity. The purpose of the research is to consider the contradiction between the need to increase labor productivity and the development of technological innovations, which include the development of artificial intelligence and ensuring effective employment. The research was conducted using the method of in-depth interviews, content analysis of documents and analysis of statistical data. The research is based on the concept of human capital development and aims at finding opportunities to improve the well-being of people, improve the quality of the workforce, including through improving their well-being based on increasing productivity and skill levels. The research has shown that the development of artificial intelligence is indeed a factor in the growth of labor productivity. However, the uneven development of the countries and regions of the Russian Federation impedes the development of modern technologies and the labor productivity accordingly. The analysis showed that the forecasts of employment change in connection with the development of artificial intelligence do not always coincide, which is also explained by the uneven development. On the example of the Kemerovo region, it is shown that the level of business inclusion in the development of artificial intelligence technologies is very low, which does not form the need for scientific and practical study of the possibilities of using AI in the economy of the industrial region. The results contain important statements about the relationship between the development of artificial intelligence and labor productivity, and also show the opinion of the expert community of leaders in the industrial region.

Keywords Artificial intelligence · Labor productivity · Digital economy · Computer literacy · Employment · Digitalization

JEL Codes J00 · J01 · J08

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1 Introduction

Productivity is a key component of GDP growth and population well-being. The slowdown in this indicator is currently observed throughout the world. In the leading countries of the world, the labor productivity indicator in the period from 2010 to 2018 barely increased by 1%, which is 2–3 times less than in the 1990–2000s. And if you compare with the middle of the last century, then the gap increases to 5–6 times (Migunov 2019). Even though labor productivity is not the only determinant of economic growth, in the long run, everything comes down to this indicator.

In Russia, the problem of low labor productivity was most acutely identified among state problems in 2012. Unfortunately, over the past period, significant positive progress has not yet been achieved (OECD 2020).

Even though the problem of labor productivity is common, its reasons in Russia and in the leading countries of the world are most likely different. Among the reasons for the slowdown in labor productivity growth are the low level of training of specialists, outdated fixed production funds, the inability, and unwillingness to use modern management technologies, corruption, inefficient government regulation, etc. Among the factors that can have a significant positive impact on labor productivity are the following: automation of production, optimization of business processes, increased motivation of workers to high-performance labor, digitalization, and the development of artificial intelligence technologies. The most controversial views are expressed on the latter factor. Any progress, including digitalization, leads to an increase in labor productivity (Ernst et al. 2018; Porokhovsky 2019). However, the so-called "Solow paradox" is confirmed and implies that productivity growth takes place primarily in the digital economy, and to a lesser extent it affects the productivity growth of the entire national economy. The purpose of the research is to study the opinions of theorists and practitioners on the impact of artificial intelligence on the level of labor productivity.

2 Materials and Methods

In-depth interview, content analysis, and statistical method are chosen as the main methods of research. Analysis, synthesis, comparison, and abstraction were used as methods of the research. The research is based on the concept of human development, where the fundamental foundations of the socio-economic development of Russia and its regions, material and social well-being are decent work and effective employment.

The empirical basis of the research was articles by Russian and foreign scientists, answers from heads of various organizations in Kemerovo, regulatory documents developed at the state level, official statistics and the websites of state executive authorities.

3 Results

In the past few years, the topic of the development of artificial intelligence (AI) has become quite widespread both in scientific publications and in the media. Most of those who conduct their research in this direction conclude that in the next 5–10 years' artificial intelligence can lead to unprecedented changes in the sphere of life of the whole society and each and every person (McKinsey Global Institute 2018b). Professor Agraval (2018) book describes the impact of artificial intelligence on management and decision-making, about the opportunities that open up in forecasting. The authors of the book convincingly prove that artificial intelligence inevitably penetrates the business and makes its development integral to the development of artificial intelligence.

In the "National Strategy for the Development of Artificial Intelligence for the Period until 2030" artificial intelligence is defined as a set of technological solutions that allows you to simulate human cognitive functions (including self-training and search for solutions without a predetermined algorithm) and obtain results comparable, at a minimum, to the results of human intellectual activity (Decree of the President of the Russian Federation 2020). Some areas of the strategy have already been sharply criticized; others are supported by the professional community.

In accordance with the strategy, the development of a set of technological solutions requires a lot of systemic work (Fig. 1), the efforts of a large number of specialists, that is, human resources of the highest level, which the Russian labor market, especially the regional one, in our opinion, cannot yet offer.

At the same time, the forecast of the world development of artificial intelligence shows that according to various estimates the growth of the global market for AI

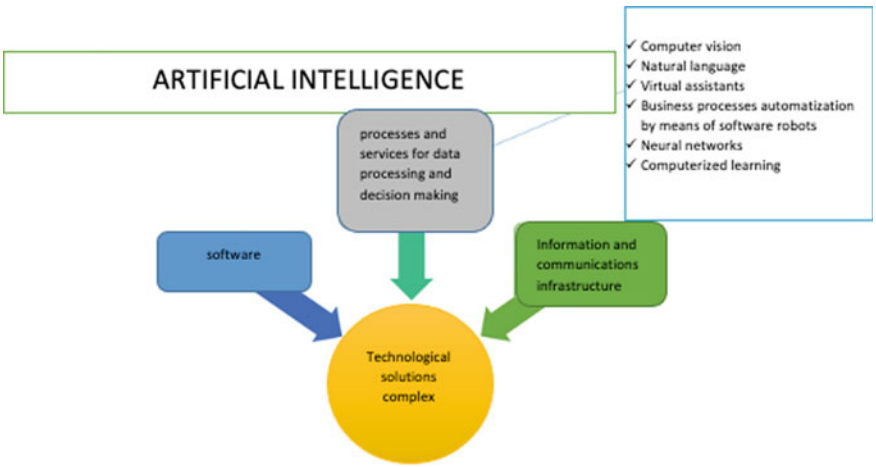

Fig. 1 AI content. *Source* Decree of the President of the Russian Federation of 10.10.2019 No. 490 "On the development of artificial intelligence in the Russian Federation" (2020)

solutions ranges from 31 to 37% per year. Currently, artificial intelligence is the most trending direction, and it has covered all the developed countries of the world. The development of artificial intelligence turned out to be a highly attractive business from 2014 to 2019.

Artificial intelligence leads to the development of the production of robots with different purposes. It is believed that as a result of the robotization of the economy, many people will lose their jobs. Some experts believe that up to half of the professions may disappear. However, another part of researchers believe that artificial intelligence does not destroy, but creates jobs. Instead of disappeared professions, new ones will arise.

In the report of the company "How will automation affect employment?" (PWC UK Research 2020), three waves of automation of jobs associated with the development of technology are highlighted.

- The first one will take place in the early 2020s and will entail a reduction of 3% of jobs. It is associated with the algorithm development of elementary routine procedures and professions.
- The second will be held in the late 2020s and will be associated with the expansion of the scope of application of robots. It will affect up to 20% of jobs.
- By the mid-2030s, the third wave of robotization will affect 30% of professions.

Artificial intelligence creates a new virtual workforce, complements and improves the skills and abilities of existing labor resources and physical capital, stimulates the development of innovation. This is what the Russian economy and especially its regional systems lack. Demand for workers with high levels of digital skills may increase. The availability of skills in the use of artificial intelligence will contribute to the growth of wages. Those with skills in the use of artificial intelligence will be more competitive in the labor market, which will encourage other workers to master such skills. Thus, the positive effect of the development of artificial intelligence technologies is obvious.

The Russian model of using artificial intelligence contains the following areas of use:

1. improving the efficiency of management processes in a broad sense;
2. automation of routine production operations (although artificial intelligence is not needed for this—author's note)
3. application of separate intelligent equipment and robots,
4. improving employee security in business processes
5. improving customer loyalty and satisfaction
6. the Use in HR.

Even the majority of Russian regions approach realization of the listed above directions, which directly could increase labor productivity very slowly. According to survey results of regional authorities (all 79 regions being interviewed) conducted by the Russian Government Analytical Centre in April–May, 2019, in 34 regions the regional program for digitalization is developed or is at a development stage, and in 45 regions it is being absent and process of development hasn't yet begun.

It should be noted that implementation of the National project "Digital Economy" within which development of artificial intelligence is provided has begun back in 01.01.2019. Such situation calls into question a hypothesis that the artificial intelligence in the Russian Federation will be able to affect labor productivity in the nearest future. At the same time among digital pass-through technologies from 79 regions, which participated in poll, only 37 regions declared to use artificial intelligence and neurotechnologies (Analytical Report 2019). The analysis of contents of the regional programs "Digital Economy" showed that in a number of regions even the concept "Artificial Intelligence' is being distorted.

We will stop only on one direction of the regional program: Digital Economy: in the Kemerovo region—highly trained specialists of digital economy. The presence of highly qualified personnel is a fundamental condition of both development of artificial intelligence and increase in labor efficiency. The content analysis of contents of documents of the program showed that the terms "Artificial Intelligence" and technologies connected with it in this project are absent. Contents show that the region is interested in the increase in the general level of competence of experts in the field of digital economy and digital literacy of the population.

In November–December, 2019 the research group under the guidance of the author of epy article conducted the survey of CEOs (all 23 respondents participated in the research). The data collected was carried out by method of a free interview in the place of work of the respondent. All respondents have length of service on senior positions more than three years. All respondents got an education in higher education institutions of Siberia. Four persons have two graduate degrees. Among the respondents there are representatives of both public institutions and private business. Respondents represent the following fields: medicine, education, public administration, trade, transport, coal industry, and IT company.

Four subjects in total were allocated in the interview. One of them is digitalization and artificial intelligence. The research showed that for the last three years, practically in all organizations (92%), technological innovations were introduced: an electronic queue for patients, automation of work of doctors on filling of the out-patient card, a new type of medical examination of endoscopic procedure, use of BI (Business intelligence), use of a video stream for communications in the company, use of Trello for project management, new technological lines in production of the enriched coal, productions of meat and milk, work with Big Data, online cash desks, participation in the auction in electronic platforms, the new complex systems of information security, etc.

Practically all called innovations are connected with information technology development and digitalization of the majority of processes. The interviewed CEOs have given reasoned conclusions about how these processes can affect labor productivity and employment. The majority (74%) has considered that the number of employed in routine work will decrease due to reduction of jobs in such fields, which will be managed to be automated. At the same time, experts conclude that there will be new professions, new jobs at which the people serving the software, the new equipment, etc. will be engaged. These will already be high productive jobs, where people will be able to produce products (or provide services) for a larger amount for

lesser time, which will indicate an increase in labor productivity. In the labor market, it will be increasingly difficult to find work for people without education or with low qualifications. "Something needs to be done about it," concludes one of the experts. At the same time, one in four respondents' claims that robots, machines and a general focus on optimizing all processes will contribute to crowding out workers and can lead to negative consequences in the labor market, increased unemployment and a decrease in the standard of living for people with low qualifications. In response to the question "In connection with digitalization, what changes are most likely to take place in your organization?" all interviewees made it clear that no one conducts special training, they do not develop programs, that is, they develop in an evolutionary way due to external influence and internal needs. 82% of surveyed managers are positive about remote employment and are ready to consider such a form in the future in their careers. Today, the level of computer literacy of employees, according to managers, is at the average level.

The reasoning of managers about artificial intelligence deserves special attention. An analysis of the answers suggests that at this stage even managers have a very blurred idea of the very concept of "Artificial Intelligence", its technologies, and development prospects. About half of the respondents found it difficult to answer. Some of the respondents connect the concept of artificial intelligence with drones, satellite navigation, large databases, and robots. In general, experts gave very cautious estimates that artificial intelligence technologies could be used in their companies in the near future. At the same time, with the predicted development of technological progress, if the company does not integrate artificial intelligence into its business over the next five years, it will lose to competitors (Filipova 2019). The exception is the IT Company "Goodline". When is asked: "How soon will artificial intelligence be able to affect the state of the labor market and employment of the population?" about half said, in about 10–20 years. Those who remained cautiously assumed that this influence was already beginning in some areas and industries.

Among the "advantages" of AI development, respondents see:

- Simplification of labor, reduction of routine, labor-intensive work.
- High level of accuracy, performance, efficiency of works performed.
- The robot is incorruptible and can monitor the rule of law."
- Need lesser time to complete work.
- Improve safety and reduce injuries at work.
- AI robots can be used to study the subsoil of the earth and the depths of the world's oceans, to extract fuel and resources necessary for humans.
- Artificial intelligence can be effectively used in performing repetitive, painstaking, and time-consuming tasks.

Among the negative effects of AI development, respondents noted:

- Increase in unemployment (almost every second respondent named it).
- The risk of the robot making erroneous decisions, for example, when selecting personnel.

- Due to the reduced need to use your intelligence, non-standard thinking, and multitasking, a person's mental ability can be reduced. Man will gradually be foolish. A dependency on the machines will appear.

In general, respondents rated the level of AI development in the Russian Federation on a 10-point scale by 3.8 points.

The results presented represent the expert opinion of the managers in the sample. The selection was carried out at random. The main criterion is the experience of managers and the desire to express their opinion on a number of issues related to the efficiency of using labor potential and the prospects for its development at enterprises in the Kemerovo region.

The digitalization rating compiled by the Center for Financial Innovation and Electronic Economics of the Moscow School of Management Skolkovo, the regions of the Siberian Federal District are in very different degrees of readiness for digitalization, and, therefore, for the use of AI. Kemerovo region in it is among 85 subjects and takes 33rd place. The rating reflects the existence and success of initiatives related to digitalization at the regional level and is based on quantitative metadata and expert assessments. Figure 2 shows a variation in the level of digitalization is visible even within one federal district.

When assessing the impact of artificial intelligence on the level of labor productivity, a third factor should be considered: the level of economic development. The technological gap between countries, companies, workers indicates that the impact of AI on labor productivity will be different. Therefore, countries with a high level of digitalization, a high cost of labor, and even with a low rate of growth in labor

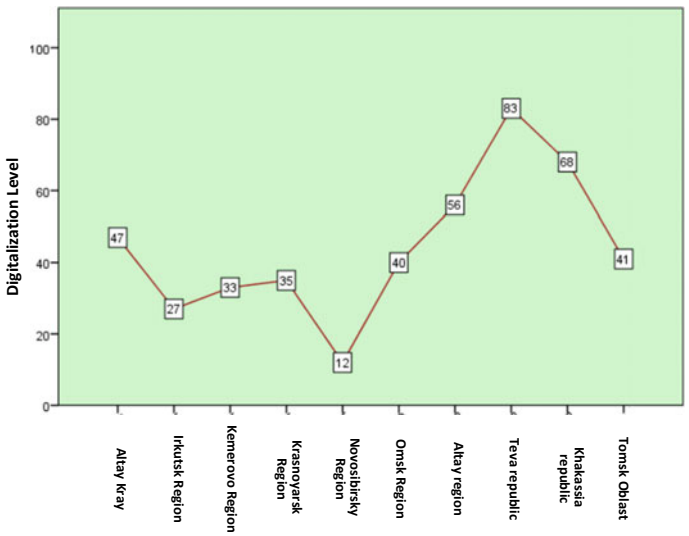

Fig. 2 Rating of regions by level of digitalization development. *Source* Official website of the Moscow School of Management Skolkovo (2020)

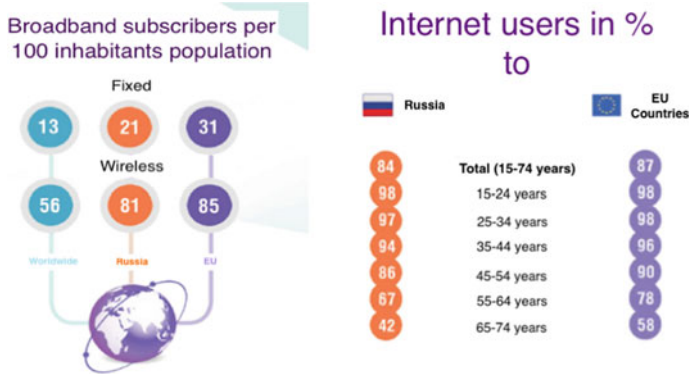

Fig. 3 Comparative information on Internet use. *Source* Official website of Rosstat (Federal State Statistics Service) (2021)

productivity, will be able to increase their cash flows, which can lead to the hiring of additional labor, and, therefore, the overall growth of the economy. The report "The Economics of Artificial Intelligence: Consequences for Labor in the Future" (Ernst et al. 2018), prepared for the International Labor Organization, notes that the ongoing wave of technological changes based on advances in artificial intelligence has caused risks of job losses and further growth of inequality. Countries with weak digital infrastructure, low investment opportunities, and low skills may lose market power, leading to the need to lay off workers. To date, countries differ greatly in the proportion of the population using the Internet (Fig. 3).

However, according to some experts (Spivakova and Rebus 2019), this inequality can mitigate the dire social consequences of AI development and general digitalization. Based on the date of the sets containing information on the development of digital competitiveness, one can see a direct connection with the level of GDP per capita and the innovation index, both now and in the forecast period (Fig. 4).

According to the McKinsey Global Institute, AI can potentially significantly increase the productivity of the global economy. Even with transition costs and competition implications by 2030, AI could further increase total output by about $13 trillion and annual global GDP growth by 1.2%, exceeding the economic impact of previous general-use technologies, such as the steam engine in the 1800s (plus 0.3% growth), industrial robots in the 1990s (0.4), information technology in the 2000s (0.6%) (McKinsey Global Institute 2018a).

4 Conclusions/Recommendations

The findings of the research are as follows:

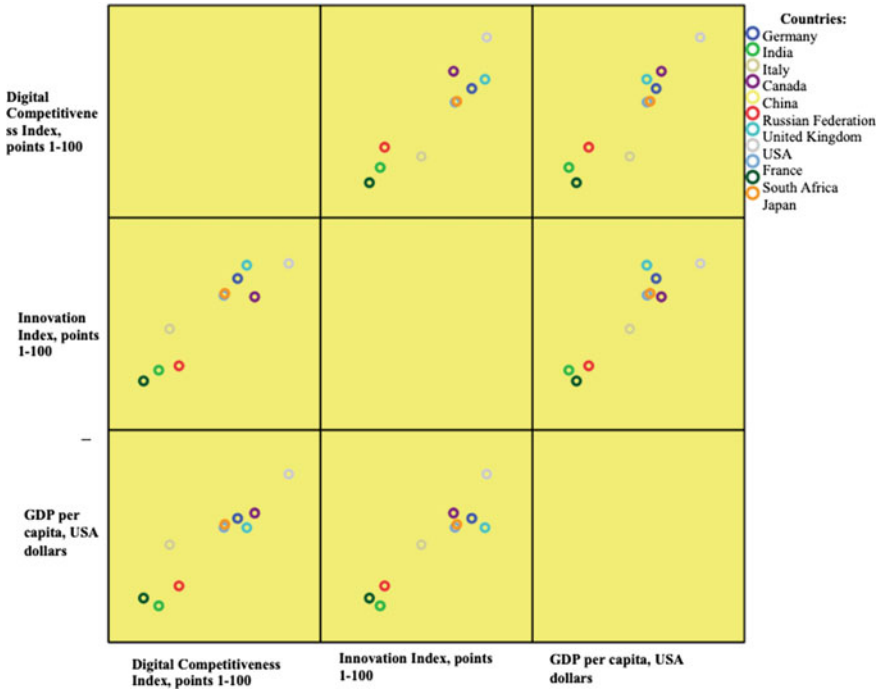

Fig. 4 Relationship of innovation index, GDP per capita and digital competitiveness index according to 2019. *Source* Data modules of the Institute of Scientific Communications (2021)

1. The development of artificial intelligence technologies is inevitable, but its impact on the development of the economy in general and labor productivity in particular will not be quick and straightforward. The development of artificial intelligence in terms of the impact on labor productivity is associated with the fact that at a certain time period it contributes to an increase in the cost of the gross product produced and a decrease in the number of employees. However, in the long run, the development of artificial intelligence can free a person from the need to work in dangerous conditions, reduce the time to manage complex systems, reduce the number of errors, etc.
2. The uneven development of the countries of the world and regions of the Russian Federation in the field of the development of artificial intelligence may increase further, which may lead to negative both economic and social consequences.
3. On the example of the Kemerovo region, it can be seen that the level of business inclusion in the development of artificial intelligence technologies is very low, which does not form the need for scientific and practical study of the possibilities of applying AI in the economy of the industrial region.
4. To stimulate the development of digital skills, it is necessary to include more modern courses in school and vocational education, develop through additional

education programs a general level of information culture, computer literacy, and work on the formation of competencies for the digital economy.

5. In connection with the trends discussed in the article, the further development of research is seen in the implementation of interdisciplinary projects in the field of artificial intelligence in various sectors of the economy, forecasting the development of AI, forecasting the social and ethical aspects of the use of AI, studying the possibilities of opening a new direction of training in higher education "Artificial Intelligence".

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Financial Benefits of Consumer Cooperation as a Way to Reduce Income Inequality in the Economy

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Abstract The research aims to identify the financial advantages of consumer cooperation as a way to reduce income inequality in the economy on the example of the experience of leading developed countries. To test the proposed hypothesis, the method of regression analysis determines the contribution of the turnover and the number of employees of consumer cooperatives in developed countries in reducing income inequality in the economy. The method of scenario analysis is also used to determine the prospects (an optimistic and pessimistic scenario) of reducing income inequality in the economy by developing consumer cooperation based on the established regression dependencies. It is proved that there are pronounced financial advantages of consumer cooperation, allowing us to define it as a promising way to reduce income inequality in the economy. Using the example of developed countries with the most large-scale consumer cooperation in 2020, the authors show that the development of consumer cooperation (increasing the turnover of consumer cooperatives) reduces the need to move to more progressive taxation, the level of poverty, and the Gini index. The experience of consumer cooperation in the form of voluntary cooperation of consumers to create public or economic goods highly demanded among cooperating consumers, as well as to generate income from investments, is recommended for use in developing countries to reduce income inequality and achieve sustainable development goals.

Keywords Financial advantages · Consumer cooperation · Reducing inequality · Income inequality · Developed countries · Sustainable development

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1 Introduction

Consumer cooperation can be carried out in various forms, the availability and effectiveness of which is primarily determined by the quality of institutional support of the economy. In developing countries with emerging market institutions, consumer cooperatives are most common in the form of forced cooperation of consumers of collective property or a collective agreement on the sharing of assets.

For example, it could be the association of homeowners in an apartment building or a suburban or a garage cooperative. In the cited examples, the property owners in the cooperative area jointly decide on using public goods and investing in their development (e.g., through cleaning and landscaping or hiring security services to ensure public safety in the cooperative area). The benefits, in this case, are non-financial and are expressed in the availability of necessary public goods.

In developed countries, due to the well-established and highly effective market institutions, cooperation is more accessible and widespread in the form of voluntary cooperation of consumers to create public or economic goods highly demanded among cooperating consumers, as well as to generate income from investments. In this case, the examples include the creation of a cooperative in the form of social service to provide educational and medical services, as well as the production of food products or the provision of financial services. Such consumer cooperatives reach large sizes, make a noticeable contribution to the social and economic development of economic systems, and provide financial benefits to their members.

This paper hypothesizes that consumer cooperatives in developed countries can help reduce income inequality in the economy. The paper aims to identify the financial advantages of consumer cooperation as a way to reduce income inequality in the economy on the example of the experience of the leading developed countries.

2 Literature Review

The problem of income inequality in the economy and social justice for sustainable development is revealed in the following works (Casalegno et al. 2020; Huang et al. 2020; Miao and Ju 2020; Ouyang et al. 2020; Pu et al. 2020). Several scientific works discuss some advantages of consumer cooperation (Bogoviz et al. 2018, 2019; Bolgova 2017; Guseva et al. 2019; Medentseva 2017; Popkova and Alferova 2019; Pu et al. 2020; Tarakanov et al. 2020). Nevertheless, despite a fairly large number of publications, the financial advantages of consumer cooperation have not been sufficiently studied. Moreover, the contribution of cooperation in reducing income inequality in the economy and achieving sustainable development goals has not

been adequately reflected in modern economic science and, therefore, needs further research, which determines the relevance of this research.

3 Materials and Methods

To test the proposed hypothesis, the authors implement the method of regression analysis to determine the contribution of the turnover and the number of employees of consumer cooperatives in developed countries (EURICSE 2019) to reducing income inequality in the economy, the indicators of which are as follows:

- The transition to more progressive taxation and rethinking the way corporations, wealth, and labor are taxed nationally and in international cooperation (World Economic Forum 2020);
- The poverty headcount ratio at national poverty lines (World Bank 2020b);
- The Gini index estimated by the World Bank (World Bank 2020a).

The lower the values of these indicators of income inequality in the economy, the better, since the need for progressive taxation indicates a market failure in the distribution of income. The poverty headcount ratio at national poverty lines characterizes the overall poverty in society. The Gini index shows the concentration of national income in the hands of a small economic elite. Therefore, the hypothesis is considered proven if negative values of the regression coefficients are observed.

For the study, the authors formed a sample of the top 10 developed countries included in Euricse's World Cooperative Monitor for 2019 with the highest results in consumer cooperation (cooperation type—consumer/user). Table 1 contains data on the largest consumer cooperatives in the sample countries and income inequality in these economies.

The authors also implement the method of scenario analysis to determine the prospects (an optimistic and pessimistic scenario) of reducing income inequality in the economy by developing consumer cooperation based on the established regression dependencies. The hypothesis will be recognized proven if the income inequality in the economy reduces by at least 5% due to the development of consumer cooperation in the optimistic scenario.

4 Results

To identify the financial benefits of consumer cooperation, the regression curves (Figs. 1, 2 and 3) show the contribution of the turnover and the number of employees of consumer cooperatives in developed countries to reduce income inequality in the economy.

According to Fig. 1, the need to move to more progressive taxation is reduced by 0.0558 points when the turnover of the largest consumer cooperatives in developed

Table 1 Consumer cooperation and income inequality in developed economies in 2020

Country	Consumer cooperative	Turnover, bln. USD	Economic activity	Number of employees, people	Transition to more progressive taxation, points 0–100	Poverty headcount ratio at national poverty lines, % of the population	Gini index estimated by the World Bank
France	Groupe Crédit Agricole	96.25	Financial service	139,000	52.0	13.4	31.6
Germany	BVR	55.29	Financial service	177,248	54.1	16.0	31.9
Switzerland	Coop Swiss	28.59	Wholesale and retail trade	86,319	64.5	14.6	32.7
Netherlands	Rabobank	23.60	Financial service	43,729	59.2	13.2	28.5
Italy	Coop	15.14	Wholesale and retail trade	59,902	44.0	20.3	35.9
Canada	Desjardins Group	15.10	Financial service	45,656	55.6	–	33.3
Finland	SOK	12.74	Wholesale and retail trade	39,382	65.2	11.6	27.4
UK	Co-operative Group Limited	12.20	Wholesale and retail trade	65,887	53.5	18.6	34.8
USA	HealthPartners Inc	6.65	Education, health, and social work	26,000	55.8	–	41.1
Denmark	Coop amba	5.93	Wholesale and retail trade	63,645	62.1	12.5	28.7

Source Compiled by the authors based on EURICSE (2019), World Bank (2020a, b) and World Economic Forum (2020)

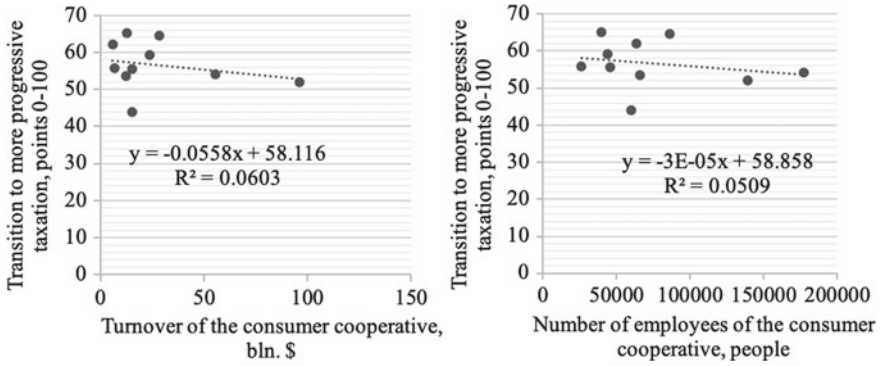

Fig. 1 Regression curve of the dependence of the need to move to more progressive taxation from consumer cooperatives in developed countries in 2020. *Source* Compiled by the authors

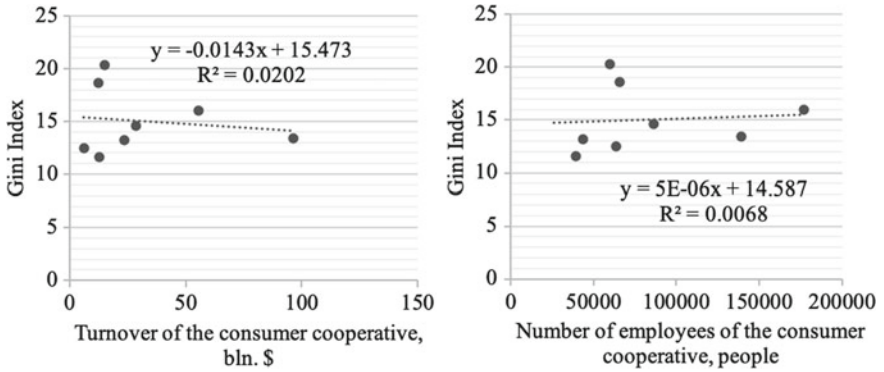

Fig. 2 Regression curve of the dependence of the Gini index on consumer cooperation in developed countries in 2020. *Source* Compiled by the authors

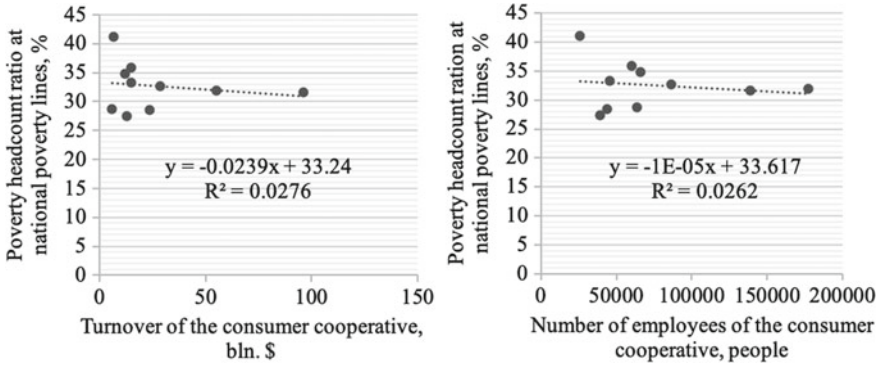

Fig. 3 Regression curve of the dependence of poverty level in the economy on consumer cooperation in developed countries in 2020. *Source* Compiled by the authors

countries increases by $1 billion. The dependence of the resulting indicator on the number of employees of the consumer cooperative is negligible (although negative).

According to Fig. 2, the Gini index decreases by 0.0143 when the turnover of the largest consumer cooperatives in developed countries increases by $1 billion. The dependence of the resulting index on the number of employees of the consumer cooperative is negligible and positive.

According to Fig. 3, the poverty headcount ratio at national poverty lines decreases by 0.0239% when the turnover of the largest consumer cooperatives in developed countries increases by $1 billion. The dependence of the resulting indicator on the number of employees of the consumer cooperative is negligible (although negative).

The obtained results of regression analysis indicate the inconsistency and insignificance of the number of employees of consumer cooperatives. However, they show the expressed significance of the positive impact of the turnover of the consumer cooperative on all considered indicators of reducing income inequality in developed countries. This allows us to make two scenarios:

- Optimistic scenario, in which we substitute the regression equations in Figs. 1, 2 and 3 with the maximum value of consumer cooperation from Table 1 ($96.25 billion from France);
- Pessimistic scenario, in which we substitute the regression equations in Figs. 1, 2 and 3 with the minimum value of consumer cooperation from Table 1 ($5.93 billion from Denmark) (Figs. 4 and 5).

According to Fig. 4, under the optimistic scenario (with the growth of the turnover of the largest consumer cooperatives in developed countries by 254.53%), there will occur the following improvement of indicators showing a reduction in income inequality in the economy:

- The need to move to more progressive taxation will decrease by 4.81% (up to 52.75 points);
- The poverty headcount ratio at national poverty lines will decrease by 6.18%. (up to 14.1%);
- The Gini index will decrease by 5.06% (up to 30.94).

According to Fig. 5, under the pessimistic scenario (with a decrease in the turnover of the largest consumer cooperatives in developed countries by 78.16%), there will occur the following deterioration of indicators showing an increase in income inequality in the economy:

- The need to move to more progressive taxation will increase by 2.09% (up to 27.79 points);
- The poverty headcount ratio at national poverty lines will increase by 2.42% (up to 15.39%);
- The Gini index will increase by 1.56% (up to 33.1).

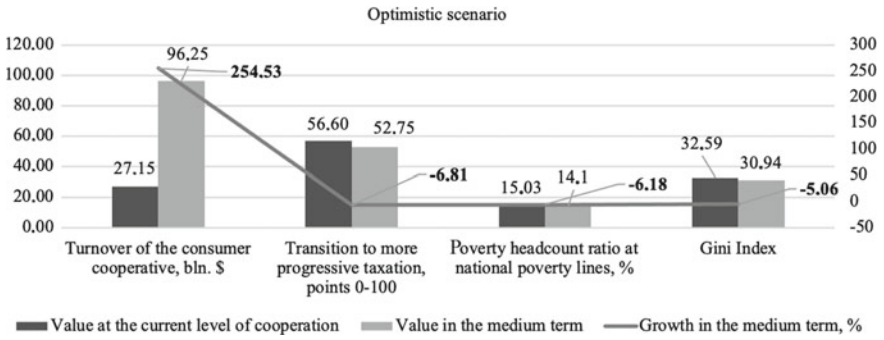

Fig. 4 Optimistic scenario for developing consumer cooperation in developed countries and the implications for income inequality. *Source* Compiled by the authors

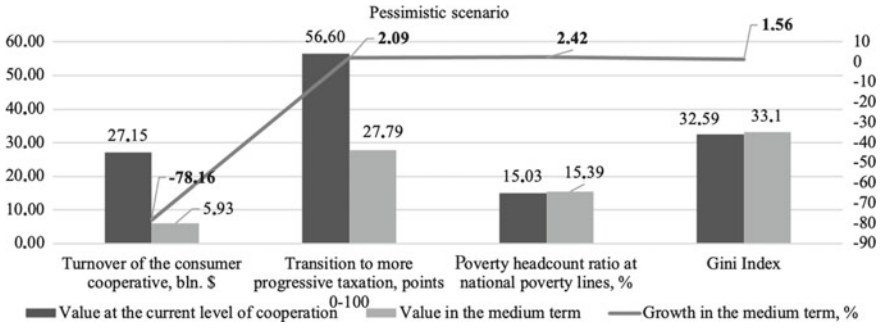

Fig. 5 Pessimistic scenario of the development of consumer cooperation in developed countries and the implications for income inequality. *Source* Compiled by the authors

5 Conclusion

Thus, the hypothesis is proved. There are pronounced financial advantages of consumer cooperation, allowing us to define it as a promising way to reduce income inequality in the economy. Using the example of developed countries with the most large-scale consumer cooperation in 2020, the authors show that the development of consumer cooperation (increasing the turnover of consumer cooperatives) reduces the need to move to more progressive taxation, the level of poverty, and the Gini index.

According to the optimistic scenario, with an increase in the turnover of the largest consumer cooperatives in developed countries by 254.53%, there would be a decrease in income inequality in the economy: the need to move to more progressive taxation would decrease by 4.81%, the poverty headcount ratio at national poverty lines would decrease by 6.18%, and the Gini Index would decrease by 5.06% (up to 30.94).

Thus, the experience of consumer cooperation in the form of voluntary cooperation of consumers to create public or economic goods highly demanded among

cooperating consumers, as well as to generate income from investments, is recommended for use in developing countries to reduce income inequality and achieve sustainable development goals.

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State Financial Support for the Cooperative Sector of the Economy: Assessing the Need Depending on the Income Level

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Abstract The paper aims to assess the need for the financial support of the cooperative sector of the economy, depending on the national income level, as well as the benefits of the state support. For the study sample, we choose five countries from each income group of the World Bank classification. For each group, we calculated the correlation between the number of cooperatives, the state financial support for the cooperative sector, and high-tech exports (via correlation analysis). Moreover, we identified the prospects for technological development of each country group at the 10× level of state financial support for the cooperative sector (via regression analysis). We identified a strong variation of correlation between the number of cooperatives and the level of state support for the cooperative sector (73.21%) and an even stronger variation of correlation between the number of cooperatives and high-tech exports (180.91%). This indicates profound differences in the demand for financial support for the cooperative sector and its effectiveness in countries with different income levels. State financial support for the cooperative sector is the most efficient in above-average income countries, where the correlation between the number of cooperatives and the state financial support is 44.39%, and the correlation between the number of cooperatives and high-tech exports is 78.20%.

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Keywords State financial support · Cooperative sector · Countries with different income levels · Efficiency · Cooperation

JEL code C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

1 Introduction

The cooperative sector of the economy contributes significantly to economic development. The current approach to managing the development of the cooperative sector mainly involves deregulation. The ability of cooperative initiatives (e.g., clustering) to improve the market and financial performance of business entities has been actively studied. From the government's point of view, cooperation is a mechanism that supports national entrepreneurship and domestic production.

In practice, cooperation often goes beyond mere collaboration (coordinated actions on the target market) and also involves technological cooperation. Due to this, cooperation can serve a new, under-researched role of increasing the competitiveness of national goods in international markets. In this case, cooperation supports free trade and intensifies its beneficial impact on the economy.

Post-pandemic recovery will entail restarting the globalization trends; therefore, all mechanisms of promoting free trade will be in high demand. This fact increases the relevance of studying the new role of cooperation in supporting technological development of the economy.

In this study, we will try to prove the following working hypothesis, "The new role of cooperation will need an alternative approach to managing the development of the cooperative sector, based on the state financial support. The scale and the benefits of financial support vary significantly among the countries with different income levels". This study aims to evaluate the need for state support of the cooperative sector and its benefits in various countries.

2 Literature Review

The patterns and advantages of the development of the cooperative sector of the economy are analyzed in the works of numerous Russian and foreign scholars (Bintoro et al. 2020; Franco and Haase 2020; Lee et al. 2020; Popkova and Sukhodolov 2017a, b). Existing state management practices of the cooperative sector are a subject of several scholarly studies (Kvasha et al. 2019; Pivovarova and Yerofeyeva 2019; Veselovsky et al. 2018a, b). The literature review demonstrated that the theory and practice of cooperative sector development and functioning are widely studied, but the field of cooperation has many research gaps, including the following:

- The ability of cooperation to contribute to the technological development of the economy is unproven and insufficiently researched;

- The need for state support of the cooperative sector is undefined;
- The differences in the cooperative sector among the countries of different income groups are vaguely understood.

This study aims to fill these research gaps.

3 Materials and Methods

To get more accurate results, we sampled countries with different income levels, according to the Atlas method (Zaytsev 2020) and the newest World Bank statistics (World Bank 2021a). The sample consists of 5 countries in each income group.

We calculated the dependence (via correlation analysis method) between the number of cooperatives (CICOPA 2021) on the one hand, and the state financial support for the cooperative sector (World Bank 2021c) and high-tech exports (World Bank 2021b) on the other hand. If the variation of these two correlation coefficients exceeds 20% in both cases, we will assume that the hypothesis is correct. The empirical basis of this research is presented in Table 1.

To ensure the practical relevance of this study, we evaluate the prospects of technological development in each category of countries if the state support for the cooperative sector in them is increased tenfold. We used the regression analysis method to clarify the correlations described above in all groups of countries. Then we calculated the long-term impact of increasing state support for the cooperative sector in each group.

4 Results

We calculated the contribution of financial support for the cooperative sector to the increase in high-tech exports in all groups of countries. The results of the correlation analysis, applied to data from Table 1, are presented in Fig. 1.

According to Fig. 1, state financial support for the cooperative sector has more effect on the number of cooperatives and high-tech export in the countries with higher-than-average income, where the correlation of the number of cooperatives and the financial support for it is 44.39%, while the correlation of the number of cooperatives and high-tech export is 78.20%.

It is less efficient in high-income countries, where the correlation between cooperatives and state support is 86.95%, while the correlation between cooperatives and high-tech export is 8.46%. In countries with lower-than-average income, the correlation between cooperatives and state support is 63.15%, while the correlation between cooperatives and high-tech exports is 8.78%.

State support has very low efficiency in low-income countries, where the correlation between cooperatives and state support is negligibly low—1.93%, while the

Table 1 State financial support for the cooperative sector, number of cooperatives, and the share of high-tech exports in various countries in 2020

Income group	Country	Number of cooperatives	State support via technical cooperation grants, USD	High-tech exports, % of manufactured exports
High (12,535 + USD)	South Korea	11,017	102,460.00	32
	Israel	1	56,320.00	23
	Czechia	1402	35,700.00	21
	Latvia	90	14,950.00	17
	Singapore	82	7520.00	52
Higher than average (4046–12,535 USD)	Brazil	6582	189,930.00	13
	Russia	67,209	731,150.00	13
	India	610,020	490,860.00	10
	China	1,008,266	562,310.00	31
	South Africa	2644	124,790.00	5
Lower than average (1036–4045 USD)	Egypt	12,728	216,870.00	2
	Philippines	9431	182,150.00	62
	Zambia	16,133	87,480.00	2
	Zimbabwe	3960	67,040.00	5
	Lesotho	90	6940.00	0
Low (less than 1036 USD)	Mali	70	129,830.00	1
	Rwanda	5514	90,730.00	11
	Uganda	10,641	124,980.00	4
	Niger	13,000	74,850.00	3
	Kyrgyzstan	508	54,780.00	7

Source Compiled by the authors based on CICOPA and World Bank data (CICOPA 2021; World Bank 2021b, c)

correlation of cooperatives and high-tech exports is negative (−9.64%). Variation of correlation was 73.21% for cooperatives and state support pair and 180.91% for cooperatives and high-tech exports pair. We used the method of regression analysis to more accurately define dependencies for expanded groups of countries; the results are presented in Figs. 2 and 3.

Building upon the regression curves (Figs. 2 and 3), we input the 10× values of state support into the regression equations to evaluate the growth prospects for the number of cooperatives and high-tech exports (Fig. 4).

Figure 4 shows that, in the high-income countries, increasing state support raises the number of cooperatives the most (by a factor of 135.311 at the tenfold increase). However, the other benefits of state support are extremely unpronounced—high-tech exports increase by a factor of 1.01 (i.e., remaining mostly unchanged).

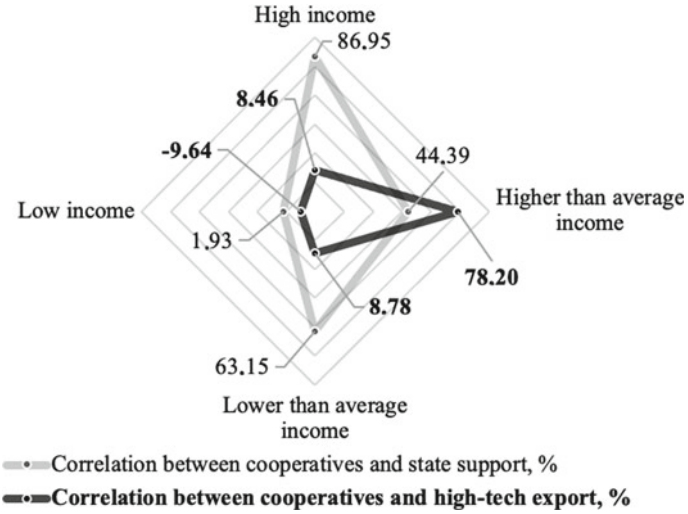

Fig. 1 Contribution of state financial support to the development of cooperation and to high-tech exports in 2020. *Source* Compiled by the authors

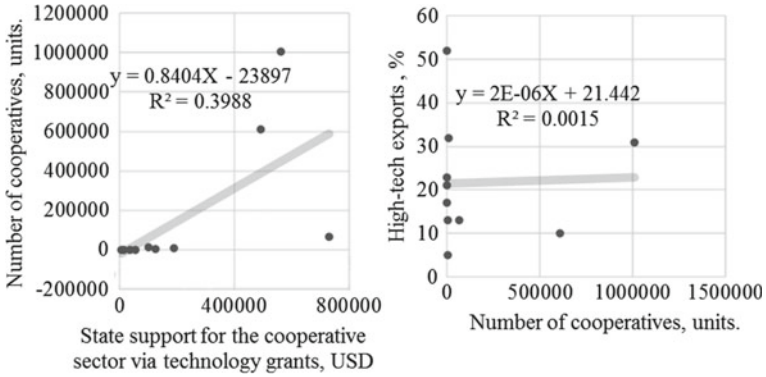

Fig. 2 Contribution of state financial support to the development of cooperation in high-tech exports in high-income and higher-than-average-income countries. *Source* Compiled by the authors

A tenfold increase in state support expands the cooperative sector of the economy by a factor of 10.34 in countries with higher-than-average income, while high-tech exports rise only by a factor of 2.33. In lower-than-average-income countries, the number of cooperatives increases by a factor of 6.18 and high-tech exports by a factor of 1.62. In low-income countries, the prospective expansion of the cooperative sector is moderately-low (up by a factor of 7.53), while the relative expansion in high-tech exports is very high (up by a factor of 56.22).

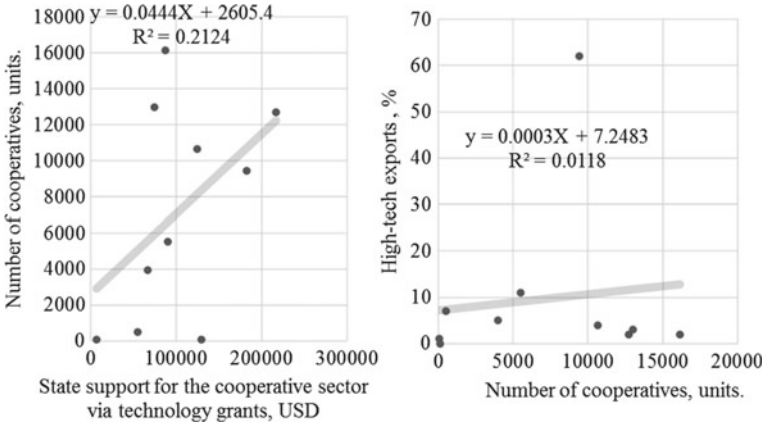

Fig. 3 Contribution of state financial support to the development of cooperation in high-tech exports in low-income and lower-than-average-income countries. *Source* Compiled by the authors

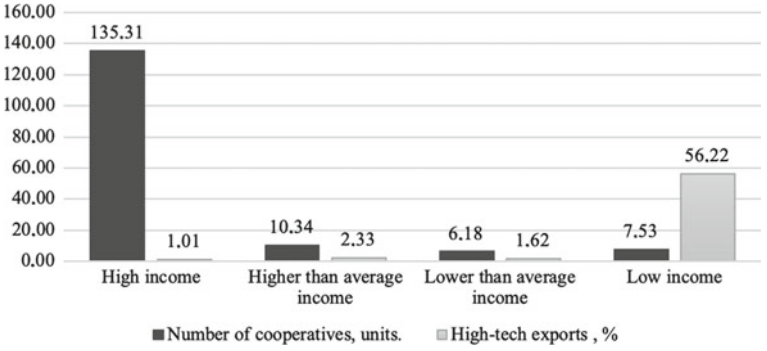

Fig. 4 Prospective growth at the 10× increase of financial support for the cooperative sector of the economy, factor. *Source* Compiled by the authors

5 Conclusion

We have proved the working hypothesis: the variation of the correlation between the number of cooperatives and state financial support for the cooperative sector was very high (73.21%), same as the variation of the correlation between the number of cooperatives and high-tech exports (180.91%). These facts indicate profound differences in the need and effectiveness of state financial support for the cooperative sector in countries with different income levels.

The highest efficiency of state financial support for the cooperative sector was observed in higher-than-average-income countries, where the correlation of the number of cooperatives and state financial support for the cooperative sector of the economy was 44.39%, and the correlation of the number of cooperatives and

high-tech exports was 78.20%. In lower-than-average-income countries, the efficiency and growth prospects were moderate, which indicates that state support for the cooperative sector is practical and beneficial.

In high-income countries, the efficiency was moderate (correlation of 86.95% and 8.46%, respectively)—the expansion prospects of the cooperative sector were high, but the added benefits for technological advancement were practically null, which reduces the practical benefit from state support. State support in low-income countries was highly inefficient, but the technological prospects were very high. This inconsistency in the experience of low-income countries deserves additional attention in further studies.

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Legal Framework and Regulation of the Cooperative Sector of the Economy

Development of a Favorable Economic Environment for Small and Medium Businesses in the Cooperative Sector of the Economy

Elena A. Astrakhantseva, Arcegal M. Bimurzaeva, Tatyana V. Tishkina, Elmira I. Basyrova, Elena S. Wegorzewo, and Rustam T. Bazarov

Abstract Many factors determine the economic well-being of a region. The level of economic development of the Republic of Tatarstan is influenced by the availability of material resources, labor resources, a favorable economic environment, the state of small and medium enterprises, and entrepreneurial risks. The complexity of the formation of prerequisites for developing the region lies in considering all the highlighted aspects. The relevance of this study is expressed in its focus on solving the economic problems of the Republic of Tatarstan. This paper defines the importance of material and labor resources, identifies the need to form a favorable economic environment for small and medium-sized enterprises, and reveals the entrepreneurial risks existing in the republic's economy. The authors analyze the main problems in the economy of the Republic of Tatarstan that hinder the economic development of the region. The paper provides official statistics for the Republic of Tatarstan on the turnover of retail trade and the turnover of medium and small enterprises by type of economic activity, including microenterprises. The authors give a forecast of the labor resources of the Republic of Tatarstan and describe the structure of the gross regional product. Moreover, they characterize the problems of investment development in the republic and their causes. Finally, the paper analyses the current state of material and labor resources, the economic environment for small and medium-sized enterprises, and entrepreneurial risks.

Keywords Economy · Labor resources · Material resources · Economic environment · Entrepreneurship · Entrepreneurial risks · Small enterprises · Medium enterprises · Investment attractiveness

JEL code R11

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1 Introduction

The Republic of Tatarstan is one of the most economically developed regions in Russia. The level of economic development of the region determines the conditions for the activities of business entities. The state of economic development in the region is influenced by many factors, including material resources, labor resources, favorable environment for small and medium-sized enterprises (SMEs), and entrepreneurial risks.

The economic opportunities of organizations and individual entrepreneurs depend on the state of the material resources in the region. This is due to the fact that material resources are a kind of totality of objects and subjects of labor available in the enterprise and influenced by the employee during the economic activity with the means of labor to use them for their needs in the process of creating a new added value. The region's labor resources are also of great importance since it is still difficult to imagine entrepreneurial activity without people. The Republic of Tatarstan has high indicators of labor resources. However, to shape the prospects for the development of the region, it is necessary to create conditions for the training of young professionals with high intellectual potential and the current able-bodied population with high qualifications.

The next factor is the formation of a favorable economic climate for SMEs. In the Republic of Tatarstan, much effort is given to the development of small enterprises. Nevertheless, the current system of support for SMEs has its shortcomings, which must be addressed. Entrepreneurial risks are a factor ensuring the development of the region and the cause of considerable economic losses. In the Republic of Tatarstan and Russia in general, there are structural problems in the legislative part of the protection of business from risk. In general, the previously mentioned factors form the level of economic development of the region. To maintain the current level of economic development and the formation of prerequisites for growth, the Republic of Tatarstan must solve many problems related to material and labor resources, the economic environment for SMEs, and entrepreneurial risks.

The Republic of Tatarstan developed the Passport of the regional project "Improvement of conditions for doing business." Moreover, the republic implements the regional project, aiming to expand property support to SMEs and create favorable conditions for self-employed citizens until 2024.

2 Materials and Methods

As a result of the project implementation, the Republic of Tatarstan plans to (1) increase the number of employed in the sphere of small and medium entrepreneurship (including individual entrepreneurs), (2) raise the share of SMEs in the gross regional product, and (3) ensure significant growth of registered self-employed citizens, taking

into account the introduction of tax regime for self-employed (Astrakhantseva et al. 2015).

The project aims, among other things, to ensure that small businesses have access to information resources, receive information, consulting, and educational support measures, and improve the business environment, including simplified tax reporting for entrepreneurs (Pozdeev et al. 2017).

Another regional project, "Accelerating SMEs," has similar and different goals.

The materials of this research include the data from the Ministry of Labor and Employment of the Republic of Tatarstan and the Russian Federation, as well as statistical data on labor resources, economic indicators of productivity, and entrepreneurial risks in SMEs. Data on material resources are available on the website of the Ministry of Economics and the Ministry of Social Development of the Republic of Tatarstan.

The methodological basis of this research consisted of comparing quantitative indicators of material and labor resources, analytical methods on the indicators of entrepreneurial risks of the Republic of Tatarstan, and the method of data comparison by analyzing the structure and dynamics of change and graphical interpretation of information. The methods of quantitative and qualitative research were used to assess the economic environment for SMEs in the Republic of Tatarstan.

According to the Territorial body of the Federal State Statistics Service in the Republic of Tatarstan, the turnover of medium and small enterprises by type of economic activity in 2019 was 2,436,027.8 million rubles, of which small enterprises accounted for 90.6%, and medium-sized enterprises accounted for 9.4%. The share of microenterprises among small enterprises is 35.4%.

Considering the structure of the turnover, we see that the largest share is taken by companies engaged in trade and repair of motor vehicles (42.9%) and manufacturing (21.6%). That is, other activities account for only 35.5%. Agriculture accounts for only 5.2%, which indicates that the conditions in this sphere are not favorable.

The Republic of Tatarstan is among the most "advanced" regions in economic terms, located in the heart of the industrial region of Russia. The economic development of the region was achieved through a targeted and effective policy of using all available resources (Alibyev 2019). One of the key factors ensuring the development of the economy of Tatarstan is material resources. In the structure of the GRP of the Republic of Tatarstan, the share of industry is 43.2%, construction—9.0%, transport and communications—6.5%, and agriculture—7.5%. The share of SMEs in the structure of GRP of the Republic of Tatarstan is 25.4% (Fig. 1).

The Republic of Tatarstan is highly dependent on the industrial sector.

According to statistical observations, the main socio-economic indicators of the Republic of Tatarstan are in approximately the same value as in the whole of Russia; some indicators even show more positive results.

In the Republic of Tatarstan as a whole, agriculture accounts for 7.1% in the structure of gross added value by type of economic activity in 2019, wholesale and retail trade accounts for 12.5%. In terms of the work performed and services rendered by own forces, the production of food and beverages accounts for 5.7% and 1.1%, respectively. As we can only assume, a minuscule share falls on the enterprises of the consumer cooperative system.

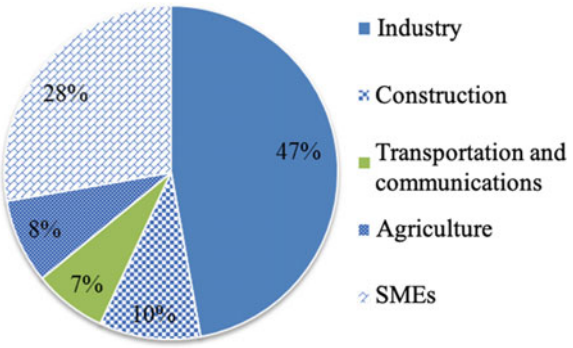

Fig. 1 Structure of GRP of the Republic of Tatarstan as of 2019. *Source* Compiled by the authors based on (Demzura and Vaulin 2015)

Figure 2 shows the structure of production of primary livestock products by categories of farms.

The industrial sector of the economy is predominant in many subjects of Russia. However, this predominance creates a dependence of the region on market conditions, currency stability, purchasing power, etc. Therefore, it is necessary to develop and stimulate the other sectors of the economy to ensure the development of the region. Regional development should also focus on reducing barriers for small businesses in the choice of sectors of the economy and providing access to the industrial sector of the economy, since this industry in the Republic of Tatarstan has high entry barriers. The Republic of Tatarstan possesses various natural resources, powerful and diversified industry, but also a high intellectual potential and a skilled workforce. Thus, as of 2019, the labor force of the republic consists of about 2.4 million economically active people with an average monthly salary of 30 thousand rubles.

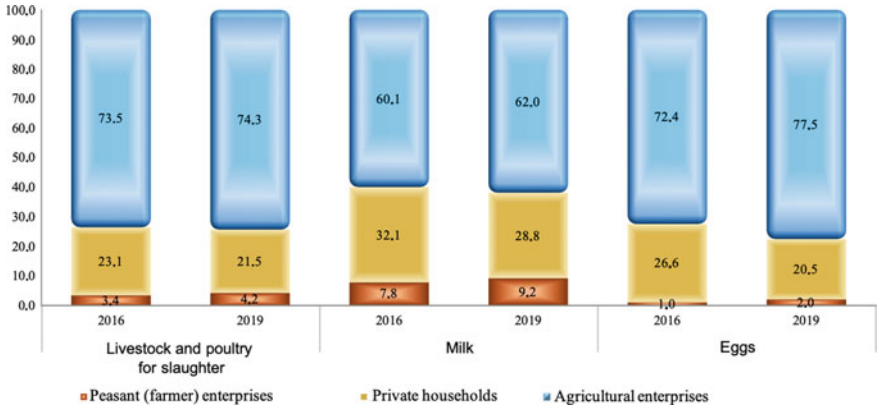

Fig. 2 Structure of production of main livestock products by categories of farms (as a percentage of the total). *Source* Compiled by the authors based on (Territorial body of the Federal State Statistics Service in the Republic of Tatarstan.(n.d.))

The higher educational institutions of the Republic of Tatarstan graduate thousands of trained students with a professional education every year.

The forecast of the labor resources of the republic (Table 1) reflects the negative dynamics. The number of labor resources is expected to decrease from 2,274.5 thousand people in 2019 to 2,248.8 thousand people in 2020. The structure of the working-age population also observes a decrease from 2,075.5 thousand people in 2019 to 2,048.8 thousand people in 2020. The increase in the number of working-age citizens beyond the permissible limits from 160,000 in 2019 to 162,000 in 2020 indicates that the region has low financial security for citizens beyond the working-age limit. The Republic of Tatarstan should develop methods to support the population with low income. The decrease in foreign migrants from 39.0 thousand people in 2019 to 38.0 thousand people in 2020 indicates that the region deals with low-skilled labor. The reduction of the number of foreign migrants will make residents more competitive in the labor market and provide higher wages.

The stable functioning of the regional economy implies an optimal balance between small, medium, and large enterprises. One of the regions, which pays considerable attention to the development of small business, is the Republic of Tatarstan. The main directions of the development of SMEs in the Republic of Tatarstan are specified in the regional law "On the development of small and medium enterprises in the Republic of Tatarstan." The Republic of Tatarstan actively supports SMEs by creating and significantly improving the existing conditions for business and providing access to financial resources for these subjects, including preferential financing. The Republic of Tatarstan also accelerates SMEs, creates support systems for farmers, and develops rural cooperation, which leads to the popularization of entrepreneurship (Gracheva and Peter 2018; Kevesh 2018; Kokin 2016).

As of May 2019, the number of SMEs in the republic has increased to 162.9 thousand, which is 1.3% higher than in 2018. Approximately 78% of SMEs are registered in major cities of the republic (including 48% in Kazan and 16% in Naberezhnye Chelny).

Table 1 Forecast of the balance of labor resources in 2018–2020, thousand people

Indicator	2018	2019	2020	Previous periods (for reference)	
				2017	2016
Labor resources, number	2,298.7	2,274.5	2,248.8	2,324.9	2,352.5
Including					
Working-age population of the appropriate age (up to retirement age)	2,101.7	2,075.5	2,048.8	2,130.1	2,158.0
Foreign migrant workers	40.0	39,0	38.0	41.0	41.5
Working people of retirement age	157.0	160.0	162.0	153.8	153.0

Source Compiled by the authors based on Demzura and Vaulin (2015)

During the reviewed period, the Verkhneuslonsky, Vysokogorsky, and Pestrechinsky districts of the Republic of Tatarstan showed significant growth in the number of SMEs. In the Azanakaevsky, Spassky, and Yutazinsky districts, the growth of SMEs is below the average value. The same trend applies to the growth in the number of cooperatives (Baldina 2018; Markova et al. 2019).

As for information on the activities of consumer cooperatives as small businesses, official statistics provide the following information: consumer cooperation accounts for 0.1%, and private cooperation accounts for 87.6% in the distribution of retail trade turnover.

The number of employed in the sphere of SMEs is 532.1 thousand people, which is by 3,937 people (0.4%) more than at the beginning of the year. By these indicators, the Republic of Tatarstan ranks 1st in the Volga Federal District and 7th in Russia.

In order to increase the demand for goods (works, services) sold by SMEs, the Government of the Republic of Tatarstan allocates funds to pay the costs of firms to buy new equipment, and creates access to state orders. Nevertheless, it does not provide the proper effect. The development of small businesses in the region should go in the direction of greater interaction between large, medium, and small enterprises, as well as in creating favorable conditions for their activities, but not in the direction of financing enterprises with low profitability. Artificial business support is debatable and can be implemented only for certain economic environments. However, in the Republic of Tatarstan, the policy of intervention in the activities of small enterprises to increase their number and share in the gross domestic product shows disappointing results. There is a growth of small businesses, but in the crisis, entrepreneurial activity is falling, and the only measure at the moment is the allocation of funds from the budget, which has negative consequences.

The next problem hindering the development of small enterprises in the region is low financial literacy. The tax authorities provide information that small enterprises often incorrectly fill out tax returns. If these mistakes are made repeatedly, it leads to an increase in tax liabilities. Moreover, there is a possibility of erroneous overstatement of the tax base. Financial illiteracy also affects the adoption of management decisions at the enterprise. The choice of unscrupulous counterparties without prior verification can also negatively impact the financial and economic activities of enterprises.

The stimulation of small businesses in the Republic of Tatarstan should be based primarily on the policy of non-interference and in the formation of a more favorable environment for the economic activity of small businesses. For this, it is necessary to solve the issue of the lack of demand for the products of small enterprises in the Russian market and improve the financial literacy of the population.

3 Results and Discussion

Considering the issue of entrepreneurial risks, it should be noted that the Republic of Tatarstan is among the regions of the Russian Federation with low entrepreneurial

risks. Despite some risks, the Republic of Tatarstan is one of the most attractive regions in terms of investment. However, there are some problems in the investment climate. The results of the "National Rating of the Investment Climate of the Subjects of the Russian Federation" highlight several specific problems of investment development in the Republic of Tatarstan. They include such problems as the regulatory environment, the problems of "Institutions for business" and "Infrastructure and resources," and the problems of support for small enterprises in the Republic of Tatarstan (Bijmyrsaeva and Tulegenov 2018).

Many reasons cause these problems: a long procedure for registration of a business entity and the complexity of this procedure; underdeveloped regulatory and legislative framework; poor work on attracting investors in businesses; the lack of opportunities to monitor business activities and reporting (Morozova and Zimin 2018).

The lack of a developed network of the hospitality industry and the quality of roads in the region also negatively impact the development of small enterprises. Nevertheless, the Republic of Tatarstan has recently begun active work in this direction.

The lack of useful, timely, and comprehensive information about measures to support entrepreneurship on the part of federal and regional authorities and the lack of opportunities for obtaining quick credit means also have some impact.

The problems of investment attractiveness of the region are expressed by a group of factors relating to legislative and infrastructural issues. To form the development of investment attractiveness, it is necessary to solve the problems identified in the region.

4 Conclusion

The Republic of Tatarstan is one of the most economically developed regions of Russia, since it has sufficient material and labor resources and ensures their effective use. The economic environment for SMEs is favorable, but there are structural problems that require attention. To date, the Republic of Tatarstan has set goals for the development of small businesses by 2025, which will positively impact the economic environment in the region. The republic has several entrepreneurial risks expressed in the instability of the currency and the presence of political currency and tax risks, which are inherent in all constituent entities of Russia. The Republic of Tatarstan should work to protect the property of the business sector from certain groups of risks. The presence of entrepreneurial risks affects the investment attractiveness of the region. The investment environment of the Republic of Tatarstan is marked by the weak legislative equipment and the absence of the required infrastructure.

Our analysis of the current state of material and labor resources, the economic environment for SMEs, and entrepreneurial risks allows us to conclude that all the "wealth" of the Republic of Tatarstan leads to the high economic activity of the region, its economic stability, and competitiveness. Therefore, it is necessary to formulate

the content of tools for managing the above-mentioned business risks and investment development problems.

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Features of Dissolution of Marriage Abroad (By the Example of Great Britain)

Irina N. Mineeva, Mikhail A. Panfilov, Elena O. Kolokolova, and Elena N. Moiseeva

Abstract This scientific article is devoted to the analysis of the main theoretical and practical aspects of the legal regulation of marriage and family relations with a foreign element in the UK on the example of divorce. The work deals in detail with the peculiarities of the procedure for the dissolution of a marriage (both with residents and not with residents of the state chosen for analysis, as well as in cases where only one of the spouses is a resident of the state) and the consequences of this legal fact, which are directly related to national, religious and cultural characteristics and traditions prevailing in the state under study. The main historical feature of the holistic system of European family law was its direct dependence on the results of political and social reforms that occurred in the XIX century. Often such "innovations" were uncoordinated and poorly combined with the realities of life. That is why, in modern Europe, there has not been a single codified legal instrument in the field of family law, which could ensure and facilitate the regulation of the sphere of marriage and family relations, including with a foreign element, and avoid the huge number of conflicts that so often arise in the direct implementation of practical work on the application of law in this field.

Keywords Matrimonial relations · Divorce · Foreign element · UK

JEL Code K3 · K33 · K36

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1 Introduction

Modern society is multifaceted in all its manifestations. Every day, an individual enters into such a number of social relations that it is difficult to escape the thought. These are civil, labor, confessional and many other relationships. The balance between them is very thin and it is very easy to lead to an imbalance in society—it is enough to say the wrong phrase or do an inappropriate action.

These problems also concern family legal relations, in particular, the marital and family sphere. Of course, I would like there to be a single regulatory act that regulates these public relations at the world level. However, we understand and realize the current situation and most likely this big change will never happen! Each State is a party to private international relations and it is distinguished by its diversity: culture, traditions, mentality, and basic preferences in the diet regime of all peoples are different, let alone the marital and family sphere. In some countries, there is still no codified regulation of family law, and "marriage and family relations" are governed by civil law or are spelled out in separate laws on private international law" (see Mineeva 2017, p. 71).

In the middle of the twentieth century, a series of consolidated and partly codified laws were adopted in England, as a result of which significant changes took place in the field of marriage and family relations. Despite the fact that new acts have acquired their legal force, the application of the legal norms contained in previous legal acts and court precedents continues. This is primarily due to cultural traditions and peculiar features of national legislation currently in force in the territory of the State (United Kingdom) chosen by us for our research.

2 Methodology

In carrying out this scientific research, we have applied a number of different methods, both general and special. First of all, a significant emphasis was placed on such general scientific methods of research as analysis and synthesis, induction and deduction. A significant role will be given to the systemic method in order to identify possible systemic elements of the unification of private international law, which will give the work scientific novelty and practical significance. In the course of scientific research, traditional methods for legal science will be used—specifically historical, formal-logical and comparative-legal, which were long used in scientific research on jurisprudence and well-established.

3 Results

Divorce is a very long, complex and costly process, which, inevitably, requires large financial, moral and physical capabilities. And if the divorce takes place in a foreign country, then these investments will be much more than in the homeland (Stepkin 2017).

We would like to consider the procedure, specificity and features of divorce from a foreign element on the example of the United Kingdom (Great Britain).

In Great Britain, unlike the Russian Federation, as in many countries of continental Europe, there is no separate codified normative legal act that combines all legal norms related to family law and, in particular, to the legal institution we are considering—the institution of dissolution of marriage with a foreign element (Vereshchagin and Krasnikova 2018) in the territory of the studied state. Most often, these issues of family legal relations are considered within the framework of civil law, are included in the private law system of national legislation and are formed by the legal norms of the Civil Code of a particular state. Therefore, in the country we are studying, the Marriage Law, adopted in 1949 and combining under its authority more than 40 previously existing normative legal acts, is the main source of legal regulation of marriage and family relations.

Many researchers today perceive British citizens as choppy lords and ladies living on the foundations and traditions of the "old world." However, as practice shows, the British are ordinary people who are not alien to family problems arising from financial instability, banal quarrels, different views on the family structure and principles of family life in general, etc., which, in the end, can lead to the collapse of the "social unit" of society.

The procedure for divorce in Great Britain (it does not matter whether residents or non-residents of the state are getting divorced, or only one of the spouses is a citizen of the country) is quite protracted and requires significant investments (Safonova 2017). On the other hand, the main steps taken in the "implementation" of this legal procedure are so simple and accessible to the ordinary citizen that the consultation and further assistance of a representative of a law firm is most likely not necessary in this case (She Lived 2015).

We will begin our research with the annulment of marriage, because today it is the easiest and fastest way of divorce, which the spouses who have the right to it by law most often try to use.

Unlike the classic "scenario" of divorce proceedings in the United Kingdom, it is possible to annul a marriage at any time after the wedding (even on the next day), having applied for this legal procedure to the relevant authorities. However, it will be necessary to prove that the marriage, as a legal act, has no legal effect or that one of the spouses perceives it as inferior for a number of reasons (Khomyakova et al. 2017).

Firstly, if the latter is declared null and void as such, that is, the marriage did not have the necessary legal effect, as required by the law of the place of its commission,

we can talk about the annulment of marriage from the very beginning of the creation of a new "social unit" of society if:

- one of the spouses has not reached the age of marriage—16 years of age;
- at the time of marriage, one of the spouses was in another or in a civil partnership (name of the union of same-sex couples);
- kin relations between the spouses (Wozniak 2018).

Based on these motives, according to current UK law, if a marriage, as a legal act, has no legal effect, then it does not exist (either in space or in time). However, when a marriage is dissolved by annulment due to the lack of legal force of the act, the former spouses are still advised to have documentary evidence of its invalidity in their hands, so that in the future there will be no unforeseen unpleasant situations if, for example, one of the former spouses again decides to bind himself to the bonds of Hymen.

Secondly, in the legal terminology and practice of the courts of Great Britain, there exists such a concept as "disputed" marriages. Therefore, these marriage unions can be annulled before the law also for a number of reasons, which are reflected in the legal norms of the current legislation of the United Kingdom:

- when the will of the spouse, when entering into marriage, was incorrectly formed, or the person did not understand, or completely differently perceived what was happening to him in reality (for example, marriage under the influence of alcohol or drug intoxication, under the influence of potent painkillers, with the use of physical or moral violence of one spouse over another or under other similar circumstances);
- the presence of STD or other sexually transmitted disease in one of the spouses at the time of marriage;
- Pregnancy of the spouse by another man;
- complete absence of intimate life between spouses from the moment of their wedding (does not apply to same-sex couples) (Shevchenko 2017).

The cost of the state duty upon dissolution of the marriage by annulment is equal to £410, which is in terms of Russian rubles at the exchange rate on October 29, 2020—41.360 rubles. 80 kopecks. (Quite a tangible amount for a simple resident, isn't it?). The duration of the procedure, taking into account all stages of document flow, will take no more than two calendar months (Izmailov 2017).

If we were to draw an analogy with Russian law, then in the territory of our state, when the marriage is dissolved, each of the spouses will pay a state duty of only 650 rubles, and in the case of a divorce based on the recognition of one of the spouses by the court as missing, incapacitated or convicted of a crime of imprisonment for more than three years—and even less, only 350 rubles. (Tax Code of the Russian Federation 2000).

Maybe that's why in Russia, according to static data, the share of divorces exceeds the number of marriages? Indeed, if the applicant were charged a more substantial amount for the dissolution of the marriage by the State, then there would be less marriage for nothing, and the spouses would think more carefully about their actions

in this direction, knowing that this would hit their pocket very much. Although our thoughts are not a panacea in solving the problem of divorces not only in the Russian Federation, but also in any other state.

Further, we would like to draw our attention to the analysis of the legal norms characterizing the divorce procedure in the UK, which takes place according to the classic English "scenario."

Despite all the difficulties of divorce proceedings, which are manifested not only in bureaucratic multi-stage, and therefore in the length of proceedings, which most often take the parties from 6 months or more, but also in its high cost (as we have already mentioned above), the dissolution of marriage in the United Kingdom through the judiciary is still very popular among the population. This is primarily due to the fact that the courts treat the resolution of cases of this nature with greater impartiality, and secondly, the lack of legal recognition of marriage contracts concluded both within and outside the Kingdom.

Therefore, in order to be entitled to apply for divorce, two conditions must be met in aggregate: firstly, before the divorce, the spouses must be married for at least 12 months, and secondly, the spouse applying to the court for the dissolution of the marriage must have a country such as Great Britain as his main place of residence (Kurochkina 2018).

If there is a foreign element in the marriage relationship, that is, the marriage is dissolved between a British and a non-resident of the country, then such a conflict link as the "law of the court" will always apply to the divorce procedure and to the controversial points arising from the latter. In other words, spouses will be divorced only under the laws of the United Kingdom and the legal rules of the nationality of the second spouse will not be taken into account (Bogdanova 2017).

Usually, the divorce procedure includes 3 stages, gradually replacing each other:

1. Petition for divorce
   You need to file an application in court, substantiating the reason for the divorce, with the simultaneous payment of a state fee of £410 (Biryukov 2019). The reasons that spouses most often cite as significant when dissolving a marriage are the following:

   - marital unfaithfulness;
   - inadequate behavior not related in any way to further cohabitation of spouses (e.g. domestic violence, abuse of alcoholic beverages or narcotic substances as well as other potent drugs, refusal to pay their own and joint bills);
   - intentional abandonment by one spouse of another;
   - lack of cohabitation for more than two years;
   - lack of cohabitation for more than five years (and consent to divorce from the other spouse is not required) (Yarkina and Zabulova 2017).

   A copy of the petition will be sent to the second spouse; to which he/she is required to respond within three calendar weeks. If the party maliciously ignores the receipt of these court documents or delays the response to the petition, then

the party sending the latter can continue the divorce proceedings that have begun without such a fact.

2. Court order for divorce (decree nisi)
   Decree nisi is a document confirming that the court does not have any objections to divorce. It can be obtained both in the case of the unequivocal consent of one of the spouses to divorce, and without such (in this case, the decision will be made during the court hearing with the obligatory presence of the parties). If the court refuses to issue a decree nisi, the party that filed the divorce petition will receive a reasoned decision, indicating its subsequent actions (for example, the court may need additional information in the case). If permission is obtained, then after 1.5 months you can apply for decree absolute.
3. Final decision on divorce (decree absolute)
   Jointly acquired property of spouses, as well as parental rights and obligations, will be distributed among spouses in a general manner, i.e. either by agreement of the parties, which in practice happens very rarely, or by a court decision, if there is any disagreement between them (Petrova 2017). And these are new court hearings, payment of state duties, waste of nerves, etc. However, this is a completely different story.

4 Conclusion

In the conclusion of our research, it can be said that, of course, every particular situation related to the dissolution of a marriage is unique in itself and it is impossible to derive a general "theorem" applicable to all divorce proceedings, but there is every reason to believe that the dissolution of marriage in the UK, carried out by its judicial authorities, will take place with the direct application of the principles of impartiality and fairness. Judicial practice shows that the nationality and financial situation of the parties to the proceedings does not play any role for the English themis, and the court decision takes into account all the family nuances and life circumstances of the former spouses.

The formalities themselves and the divorce procedure have been simplified. For example, the previous procedure was abolished, according to which church marriage can be dissolved only by a special private act of parliament. In addition, in 1937, Parliament passed an act that practically equalized the rights to divorce of the wife and husband, in particular, in the case of adultery. In 1969, this body also adopted the "Act on the Reform of Divorces," according to the legal norms of which in the event of a divorce due to marital infidelity of the wife or husband, the law requires not only evidence of an adulterer, but also that the party seeking a divorce shows that life with a changed spouse is morally intolerable to her.

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Revision Control of Financial and Economic Activities of Agricultural Cooperatives as a Type of Economic Control

Oxana V. Boyko, Marina V. Kovshova, Petr P. Shmakov, Yuriy N. Egorov, and Olga Z. Matveeva

Abstract The system of revision control of the financial and economic activities of agricultural cooperatives has gone from a system of revision unions, created on the model and likeness of the system of German cooperatives, to a fully existing powerful system with a developed infrastructure. However, revision is still considered in many ways a form of economic control and, even, according to some researchers, only one of its methods. The existence of systemic signs allows us to argue arguably that the development of the revision control system of revision unions has grown its understanding as only a form, since it occupies an important role in the implementation of economic control functions in relation to such a type of labor organization in agriculture as a cooperative. Therefore, we should talk about the need to recognize revision control, previously considered exclusively a form of economic control, as an independent type of economic control, like an revision system. Nevertheless, the existing contradictions both in terminology and in the absence of an understanding of the need to recognize the importance and significance of this area of control do not allow us to interpret it as an independent type of economic control. The article analyses the place of revision control of the financial and economic activities of agricultural cooperatives in the system of economic control, presents the arguments in favor of recognizing revision control as a separate type of economic control.

Keywords Revision · Revision control · Agricultural consumer cooperative · Economic control

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1 Introduction

Most countries that have established a cooperative system apply a system of economic control over their financial and economic activities to varying degrees. The established system of agricultural cooperation in Russia has followed its own path of development. In 2020, exactly 25 years have passed since the adoption of the Federal Law of 08.12.1995 N 193-FZ "On Agricultural Cooperation" (hereinafter—the Law) (Government of the Russian Federation 1995). The author of the Law made a rather successful attempt to transfer the experience of developing agricultural cooperation in Germany to national soil. However, the creation of a system of revision unions as an integral element of the existence and development of this area of activity has become a special way of developing the Russian system of economic control over the financial and economic activities of agricultural cooperatives.

2 Methodology

The research was carried out on the materials of existing self-regulatory organizations, as well as revision unions that are part of the self-regulatory organization RSO «Agrokontrol». In the process of studying the role of revision control of financial and economic activities in the system of economic control in order to ensure a systematic approach, methods of analysis and synthesis were used, providing for the study of the structural elements of the system, its subsystems and the organizational and economic processes taking place in them, as well as a graphical method, methods of comparison and generalization. Expert opinions of the students in this area of research were studied.

When the Act was adopted, the inspection of agricultural cooperatives was the responsibility of the revision unions (modelled on the German revision unions), which were to include all agricultural cooperatives. However, the legal field of activity of such unions was not clearly defined (Shvets 2010). Then the Law was amended in 1998, according to which the revision unions were renamed the revision unions. This change led to the creation of revision unions, the number of which in Russia by 2006 reached more than 90.

The formation of the system of revision control of agricultural cooperatives was laid down directly in 2006 with the introduction of the concepts of "revision union" and "self-regulatory organization of revision unions" into the provisions of the Law, the functions of which were partially performed by revision unions (Lopina 2001; Shvets 2010).

In accordance with the requirements of the Law, revision unions include all types of agricultural cooperatives that are required to undergo periodic revision inspections by revision unions.

And directly here we observe a bifurcation of the use of the term "revision," since within the framework of generally accepted interpretations of domestic researchers, revisions in the economic control system have always been considered generically in relation to all forms of management.

The revision of part of the researchers is defined as a form of organization of economic control of the financial and economic activities of the enterprise (Belobzhetsky 1985; Belov 2006; Butynets 1976; Kolesnikova 2010). Another part of the scientists treats "revision" as a method of economic control (Ivanova 2010; Kolesnikov 2011; Soloviev 1986). However, part of the studies also perceives the revision as both a form and a method (Melnik et al. 2009) or simply consider it an element of the economic control system (Kramarovsky 1988; Ovsiychuk 2007).

At the same time, it should be noted that economic control itself includes various types: state financial control, internal control Public control, revision control (Belov 2006).

Needless to say, considering revision as a form of internal control applied within the organization in the process of internal revisions by various revision boards is entitled to existence and recognition.

Perhaps the basis of the opinion that the revision union is only an element of the internal control of agricultural cooperatives is largely the way it is formed—through the membership of cooperatives in it, which is a feature of the civil law of the Russian Federation.

However, such an approach to the revision conducted by the revision union in the process of revisioning the financial and economic activities of agricultural cooperatives will not be acceptable, as it does not reflect the full range of tasks and functions that are carried out in the course of this activity.

In addition, one of the functions performed in the revision control process by the revision unions is the search for reserves and economic opportunities in order to make the most effective use of the available resources of the cooperative to generate the best results of its work.

Therefore, it is legitimate to speak not about revision, but about revision control, which is carried out both in order to monitor the financial and economic activities of the agricultural cooperative, and in order to coordinate cooperative activities, to prevent violations of the cooperative principles laid down as the basis of activity.

The literature review showed a high degree of knowledge of the problem posed, which was touched upon in the works of: Belov (2006, 2008, 2011), Volodina and Boyko (2016), Zyryanova and Zagurski (2019) and Kolesnikova (2011).

3 Results

In 2008, on the basis of the existing revision/revision unions, two self-regulatory organizations of the revision unions of SRO Rossoyuz "Chayanov" and RSO "Agrokontrol" were formed, and which still operate to this day. The number of members of self-regulatory organizations we have studied are presented in Table 1.

As we can see, the dynamics of the size of the revision union and their distribution among self-regulatory organizations remains relatively stable: there is no sharp surge in the number or a sufficiently powerful decline in it.

As of 01.11.2020, the number of revision unions on the official websites of self-regulatory organizations is 97 based on the data of the rosters of members:

- SRO Rossoyuz «Chayanov»—47 revision unions;
- RSO «Agrocontrol»—50 revision unions.

The activities of these self-regulatory organizations are monitored by the Ministry of Agriculture of Russia, which maintains the State Register of Self-Regulatory Organizations of Revision Unions of Agricultural Cooperatives, in accordance with the requirements of the Law. Self-regulatory organizations themselves are an association of revision unions (based on membership) and exercise their control.

In addition to the revision union, the agricultural cooperative is also checked by the internal structure (if any) as a supervisory board. The law provides for "looking after" the work of the executive bodies of the cooperative: the board, chairman, executive director. In addition, the same principle of having a supervisory board is used in the activities of revision unions and their self-regulatory organizations is laid down in the Law. Therefore, the process of interaction of agricultural cooperation systems and its revision control implemented in practice is quite complex (Fig. 1).

The elements of the agricultural cooperation system are interconnected in the process of implementing control functions. Each element of the system has its own authority. Supervisory boards monitor the activities of the executive bodies of the objects of control, acting as an internal control body for them.

Table 1 Number of self-regulatory organizations as of 31st of December

Year	SRO Rossoyuz «Chayanov»	RSO «Agrocontrol»	Year	SRO Rossoyuz «Chayanov»	RSO «Agrocontrol»
2008	48	43	2014	47	48
2009	50	53	2015	46	42
2010	47	57	2016	46	44
2011	48	51	2017	46	43
2012	48	50	2018	46	46
2013	47	51	2019	47	47

Source Complied by Boyko O.V.

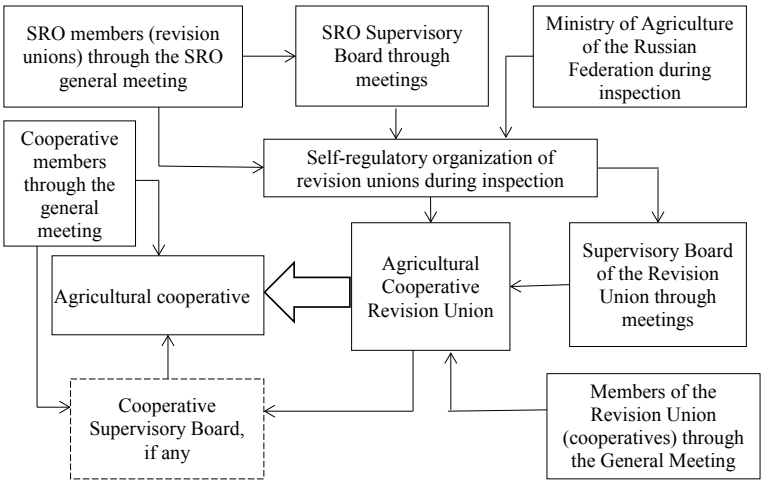

Fig. 1 Control elements of the agricultural cooperation system. *Source* Compiled by Boyko O. V.

It should be noted that the revision union is both the subject and the subject of control. However, in the process of implementing the function of revision control of the financial and economic activities of agricultural cooperatives, he certainly acts as a subject in relation to the object of control—agricultural cooperatives.

The law establishes the tasks of revision control of agricultural cooperatives, the decision of which is reflected by the revision union in the Inspection Act and in the form of expression of opinion on significant issues in the revision opinion on the results of the revision.

4 Conclusion

In our opinion, the above studies make it possible to distinguish the main components of the system of revision control of the financial and economic activities of agricultural cooperatives: controlling bodies, objects of control, subjects of control, tasks of control. Thus, we believe that the revision of the financial and economic activities of agricultural cooperatives acts as a type of economic control (Fig. 2).

It should also be noted that the revision of the financial and economic activities of the agricultural cooperative is carried out by the supervisory board of the cooperative and the revision union, of which this cooperative is a member, exercises revision control.

The economic control of agricultural cooperatives, presented in the form of an revision of its financial and economic activities, is an important means of regulation in the current market conditions, so that it allows for the continuous monitoring, coordination and support of the sustainable development of the cooperative.

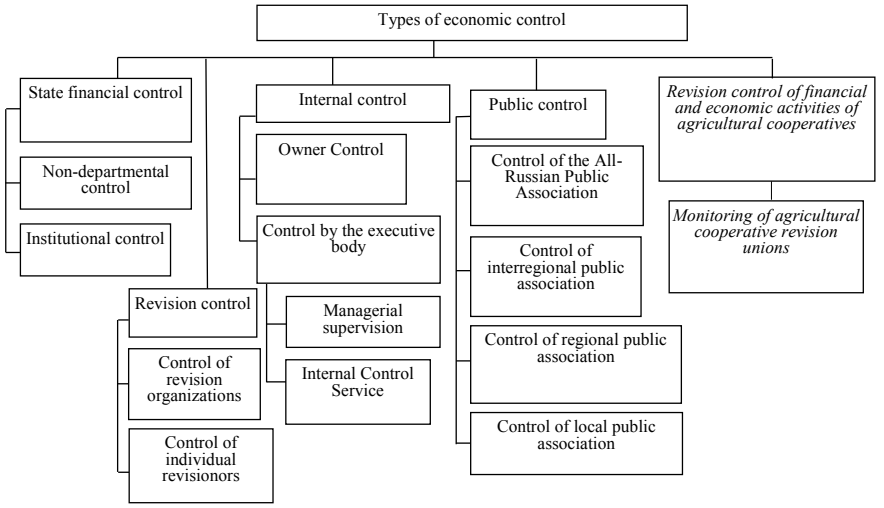

Fig. 2 Types of economic control. *Source* Compiled by Boyko O. V.

There is no doubt that the revision of the financial and economic activities of agricultural cooperatives requires its recognition as a type of economic control of the activities of agricultural enterprises officially. The Revision Union, which exercises direct revision control, forms, in the course of carrying out this activity, all the signs of an external supervisory body in relation to the agricultural cooperative. In the study, we identified and identified the main features of revision control as a type of economic control in the system of agricultural cooperatives, identified subjects and objects of this type of control.

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On Some Problems of Applying Certain Provisions of the Administrative Code of the Russian Federation to Customs Offences (Questions of Theory and Legal Regulations)

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Abstract This study focuses on the problem of training qualified specialists in the fields of jurisprudence and customs service. We analyzed theoretical and practical evidence and concluded that each legal provision has its own enforcement and regulatory potential, defined by a series of subjective and objective factors. These factors, among others, include: (1) depth of the conceptual ideas behind it; (2) the degree of their transformation; (3) judicial and technological accuracy; (4) content accuracy; and (5) legal correctness of the wording. These facts raise the question of involving the legislative bodies of Russian regions in developing independent and codified legislations on administrative offenses. Such legislations would regulate the entire system of preventing and curtailing administrative offenses and prosecuting the persons who commit them. In this case, the role of the federal center lies in creating unified material and procedural standards and rules—the Fundamentals of the Legislation of the Russian Federation on Administrative Offences in Customs.

Keywords Administrative offense · Legal provision · Administrative legislation · Level of public danger · State-public will · Unlawful act · Administrative prejudice · Customs offense

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1 Introduction

The relevance of this study lies in the fact that any legal provision has its own enforcement and regulatory potential. The potential is defined by several objective and subjective factors, such as the following:

- Depth of the conceptual ideas behind it, which correspond to the nature, essence, specific features, and dynamics of the regulated societal relations;
- Degree of the transformation of fundamental ideas in the relevant material and procedural rules;
- Judicial and technological accuracy: adequacy and legal correctness of the provisions' wordings, including the dispositions of legal norms, the terms of their application, and legal sanctions.

Assessing the enforcement effectiveness of a legal provision requires considering the external conditions and the factors of its implementation. The external conditions are usually defined under the umbrella term "law enforcement practice."

2 Methodology

The Code of the Russian Federation on Administrative Offenses (CRFAO) was adopted in 2001, in the conditions of different socio-legal and organizational realities. Unfortunately, the enforcement potential of this document is (to a large extent) already exhausted.

According to Article 72 of the Constitution of the Russian Federation, the adoption of administrative and administrative-procedural legislation is subject to the joint jurisdiction of the Russian Federation and its constituent entities. However, the federal center proposed the CRFAO unilaterally and without valid argumentation. Some of the arguments used to defend the adoption of the CRFAO were the following:

- Centralization that occurred in the socio-political life of both Russia and its constituents;
- Vague regulation of including constituent entities in administrative and administrative-processual lawmaking;
- Unreadiness of most constituent entities to create their own legal code, caused by the lack of qualified lawyers.

However, constituent entities can adopt some legal provisions for certain administrative offenses (including customs offenses) that remain outside the scope of the federal regulations.

Customs offenses account for less than 0.5% of all administrative offenses. But, according to S. M. Krilov, administrative offenses "…affect the vital interests of millions of citizens of the country. The activities of authorities that try and resolve

these cases, as if in the focus of an optical device, reflect the government's ability to actually protect the rights, freedoms, and interests of citizens" (Krilov 1986).

As practice shows, the formal participation of the constituent entities in resolving the questions of the public peace, public order, and public safety cannot properly provide a socio-stabilizing effect without accounting for the real factors, natural environment, financial well-being of the region, and the motivation of its citizens. This increases the relevance of involving regional legislative bodies in developing independent codes of administrative offenses that would regulate the entire system of preventing and curtailing administrative offenses, as well as prosecuting the persons that commit them (Federal Customs Service of the Russian Federation 2019a, 2020a).

In this case, the role of the federal center lies in creating unified material and procedural standards and rules—the Fundamentals of the Legislation of the Russian Federation on Administrative Offences in Customs (Federal Customs Service of the Russian Federation 2017, 2018, 2020b). A similar plan was previously used in developing the mechanism of criminal proceedings in the Soviet Union and its republics. All republics of the Soviet Union had their own codified criminal legislation and their own jurisdictions (Russian Soviet Federative Socialist Republic 1960; Union of Soviet Socialist Republics 1958).

The main conceptual idea of the CRFAO is expressed in Article 3.1, which defines the purpose of punishments (Russian Federation 2001).

3 Results

According to the CRFAO, punishing persons who committed customs offenses will contribute to both individual and general prevention, ultimately leading to a lower number of customs offenses and improving public safety and public peace.

Meanwhile, over the past 20 years (since the adoption of the CRFAO), there has been a steady growth in the total number of committed offenses. According to the Ministry of Internal Affairs of Russia, the number of offenses exceeded 150 million (Ministry of Internal Affairs of Russia 2019). Since the population of Russia is only 146 million people, the number of offenses defies reasonable explanation. In other words, the punishing mechanism presented in the CRFAO fails to achieve the enforcement task; therefore, it is inadequate as an instrument of public law. Our survey shows that more than 78% of respondents believe that the administrative legislation is not objectively in high demand and that the punishments for administrative offenses are unfair. These results are consistent with surveys of other scholars and sociologists (Krilov 1986; Shergin 2018; Shiryaev 2001; Yusupov 1987).

Despite the conceptual importance of these contradictions, the main drawback of the CRFAO is of the content nature. It lies in the lack of a scientifically substantiated definition of the terms "offence" and "customs offence." According to Article 2.1 of the CRFAO, an administrative offense is "a wrongful, guilty action or inaction of a natural person or a legal entity which is administratively punishable under

this Code or the laws on administrative offences of subjects of the Russian Federation" (Federation 2001). One can see that this definition lacks not only the generally accepted attributes of guilt, wrongfulness, and punishability, but also the main one—the essence of the offense, which would warrant the attention of the public authorities. In the case of a criminal offense, the essence is the danger to public safety. By virtue of public authorities, any act can be deemed unlawful and punishable. But this raises the question, "What are the objective indicators of an administrative offence that allow the government to recognize it as an unlawful act?" Without an unambiguous answer to this question, there can be no effective legal mechanism for punishing for administrative offenses (Federal Customs Service of the Russian Federation 2019b).

As early as in the 1970s, three stable opinions were formed in the administrative-legal science regarding the essential features and the socially negative nature of administrative offenses. Some scholars believe that administrative offenses have an element of danger to public safety (Krilov 1986; Shiryaev 2001). The only difference between administrative and criminal offenses was the "severity of danger to public safety" (Shergin 2018). This position was quite widespread in the Soviet period and gained practical recognition. The administrative-legal models of petty hooliganism, petty theft, etc., are formed based on this theory. These precedents gave rise to recognizing administrative offenses as a sort of "younger brother" of crimes, which caused problems in law enforcement practice. There is often no unambiguous distinction between crimes and administrative offenses. For example, the term "slander" frequently migrated from the Criminal Code to the CRFAO and vice versa. Consequently, efforts to introduce the institute of administrative prejudice into Russian criminal law have intensified in recent years.

At the same time, several scholars understood the incorrectness of the criminal-legal to administrative offenses. They believed that the essence of an administrative offense is the presence of "public harm" (Yusupov 1987). Upon closer analysis, one can clearly see that the two approaches are fundamentally the same.

In recent years, some authors started characterizing the essence of administrative offense as its antisocial nature (Shiryaev 2001). However, there is no single definition of the term "antisocial." Using this term might have been dictated by intuitive factors and the desire to disassociate from the unsuccessful term "public harm."

When comparing the three types of socio-legal deviations—crimes, administrative offenses, and infractions—one can clearly see their independent nature and that they have completely different socio-negative consequences.

4 Conclusion

In any state, there are social values generally accepted by all civilized communities: life, health, rights, freedoms, honor, dignity, property, and vital interests of society and the state. Any encroachment on these things is usually called a crime, meaning that these actions are socially dangerous and, therefore, illegal.

According to Article 2 of the Constitution of the Russian Federation, human beings and their rights and freedoms are the supreme value. Recognition, observance, and protection of rights and freedoms is an obligation of the state (Russian Federation 1993).

Acknowledgements In the acknowledgments, we would like to note the following:

Practice shows that the rights, freedoms, and legitimate interests of citizens are infringed upon in various forms, including by unfavorable conditions created by other citizens and legal entities. The state, inflicted by such infringements, is commonly called "discomfort." On the part of other citizens, discomfort can only be created by committing certain acts (foul language, harassment, property damage, loud behavior at night, etc.). It is logical to characterize all of these actions as antisocial in terms of the resulting socially negative consequences. It is apparent that administrative offenses do not infringe on the vital interests of either citizens, society, or the state but only bring citizens into the state of discomfort. However, discomfort is subjective and can only be defined by the victim of discomfort. Of course, the definitions presented by victims should stay within the strictly defined legal concept of an offense.

The discomfort inflicted by legal persons is always material and defined by a monetary value. In legal science, such actions are referred to as a civil law tort and are resolved in a civil procedural manner. By their very nature, legal entities cannot act as subjects of administrative law and can only be prosecuted under civil law and face material or financial punishment. Because of this factor, the developed CRFAO (at the time of its adoption) was subject to a Presidential suspensive veto and was returned to the conciliation commission (Shiryaev 2001).

The suspensive veto was countered by adding the institute of objective imputation of guilt to Article 2.1.2 of the CRFAO, which states the following, "A legal entity shall be found guilty of an administrative offence, if it is established that it had the opportunity to observe rules and norms whose violation is administratively punishable under this Code or under the laws of a subject of the Russian Federation, but it has not taken all the measures that were in its power in order to follow to them" (Russian Federation 2001). Such an institution is unacceptable for the public law.

The antisocial attribute has another manifestation. Some administrative offenses violate the usual, generally accepted functioning of public authorities, causing their dysfunctionality. An example would be a person's failure to comply with the lawful demands of police officers, customs officials, and any other officials. Such lawful demands include orders to stop or refrain from unlawful actions or (on the contrary) failure to perform actions (Federal Customs Service of the Russian Federation, n.d.).

These approaches allow us to define administrative offenses as "antisocial, creating discomfort for citizens, or dysfunctional states of public authorities and officials, as well as unlawful, guilty actions of individuals, for which the Code on Administrative Offences established administrative penalties".

Of course, this definition is not exhaustive. Moreover, it does not mean the work on such a complex, multifaceted, and nuanced topic as a full legal code of administrative offenses in custom services of modern Russia is over. But, it is obvious that the outdated conceptual ideas and legal approaches cannot be used to create a universal legal code that would adequately meet the current demands of citizens, society, and the state.

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Cooperation is the Basis for the Formation of the Middle Class in Russia

Dmitry I. Valigursky, Leonid P. Dashkov, Elena L. Maslova, Maria V. Gavrilyuk, and Ksenia L. Anischenko

Abstract The article examines the current state of cooperation in the Russian Federation in retrospect of its development since the adoption of the Law on Cooperation in the USSR in 1988. Today, the state is making certain advances regarding the regulation of the regulatory framework of the cooperative, the simplified creation of cooperatives of agricultural producers who are not legal entities has been approved, and the structure of the management of the cooperative is being adjusted. However, the issue of subsidiary responsibility of cooperative members remains important and unresolved. According to Russian law, subsidiary liability applies to 100% for each member of the cooperative, regardless of the amount of the share fee. Studies conducted by the authors of the article showed that in modern Russian society there is no trust in cooperatives. In this distrust there is both a historical component and the fact that the state does not see the importance of cooperation in the development of society, although the goals and objectives of the state and cooperation coincide. The third reason for distrust is a significant stratification of modern Russian society. In Russia, the income ratio of 10% of the rich and 10% of the poor exceeds 50 times. Within the framework of this article, the authors propose to develop a roadmap "Effective owner on a cooperative basis," as well as the development of a new economic mechanism for working in the countryside. The conclusion suggests itself. The future of Russia is a social and cooperative society with a market style

Keywords Cooperation · Entrepreneurship · Social inequality · Quality of life · Rural areas · Subsidiary responsibility

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1 Introduction

The relevance of cooperation today is on the agenda of the Government of the Russian Federation. As we see, certain advances are made in this direction. The regulatory framework of the cooperative is regulated, including the approved simplified creation of cooperatives of agricultural producers who are not legal entities. The structure of the cooperative management is being adjusted. And also the issue of subsidiary responsibility of members of the cooperative remains relevant. There is foreign experience in the management and responsibility of members of the cooperative. The essence of it is that each shareholder—a member of the cooperative, pays entrance and share fees. Entrance fees are not returned, and shares are returned to the ratepayer if he leaves the cooperative. Abroad, subsidiary liability is calculated taking into account the share contribution of a member of the cooperative. For example, the capital funds of the cooperative amount to 100 million monetary units. Shareholder Dimitrov Dimitar invested in the cooperative his share in the amount of 1 million monetary units. In the event of bankruptcy, a member of the cooperative is liable only within the amount of its share fee. Accordingly, Dmitrov will bear subsidiary responsibility for 1% of the value of fixed assets. According to Russian law, subsidiary liability applies to 100% for each member of the cooperative, regardless of the amount of the share fee. In continuation of this, the accounts of all members of the cooperative are blocked, and bailiffs sell the property of members of the cooperative. We understand that under such conditions and such a risk, no one wants to join a cooperative. And this cannot go on for a long time. It is necessary at the federal level to change the regulatory framework and approach the formation of cooperation in Russia with statesmanship.

2 Methodology

Studies conducted by the authors of the article throughout our country showed the main reasons why there is no trust in cooperatives at the current stage of the development of market relations.

Theoretical and applied questions on the problem studied in this article are disclosed in the works of: Stefanov and Valigursky (2019, 2016), Arustamov et al. (2020), Maslova et al. (2020), Valigursky et al. (2019a, b, c, d, 2020a, b, c), Valigursky and Kuzmina (2019), Valigursky (2016), Mareeva (2018) and Gavrilyuk (2019).

Let us highlight the main thing: first of all, this is the historical past of cooperatives. Cooperation itself has shown vitality at all historical stages of its development. But, there is a period when the state used cooperation for its "good purposes." The point is that since 1988, when the law "On Cooperation" was adopted and we lived under

socialism, thanks to this law, a rapid development of entrepreneurship on a cooperative basis began. Small enterprises were opened, which began to produce goods and services that were not on the market. The population had a great rise to open their business through a cooperative, earn money and become wealthy. Pensioners, students of all categories of the population who spent their personal savings and free time working in a cooperative joined the work. It should be noted that all today's oligarchs are exits from cooperatives, and began their business with the usual production of goods and services on a cooperative basis. But what happened? In the 1990s, all cooperatives were privatized by leaders or their members. This trend also affected consumer cooperatives, part of the cooperative property was privatized. The share of consumer cooperation in the gross domestic product of Russia is 1%. Today, entrepreneurs are afraid to join a cooperative, mindful of the historical past that the state can make a non-standard decision. It's a risk. The merit of the Law "On Cooperation" is that Russia has switched from the socialist system of the device to a market-based management mechanism and entrepreneurship without social upheavals. This great historical merit of cooperation (Fig. 1).

Secondly, paradoxically, but the state does not see the importance of cooperation in the development of society. At the same time, the goals and objectives, namely the social development of society, the fight against poverty, the creation of jobs, the preservation of culture and national traditions and the quality of life of the population are the fundamental basis for the development of the state and cooperation. The goal today is to raise the social rating of cooperation in society (Fig. 2).

Thirdly, in society today there is a great distrust of each other at all levels. The market economy has shown that money, money, money is higher than human relations. This led to the stratification of society into social groups, while the middle

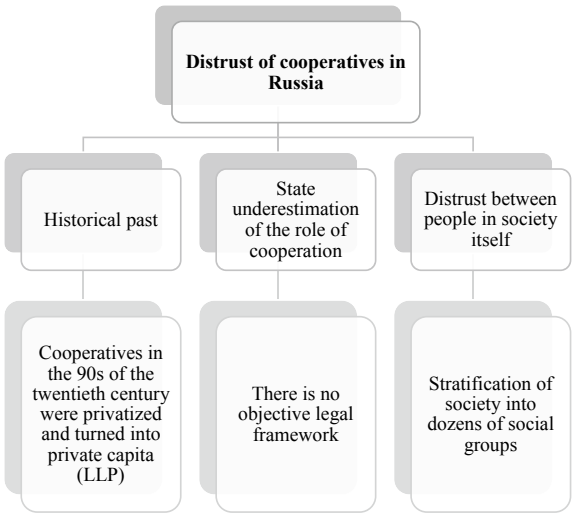

Fig. 1 The main reasons for distrust of cooperatives in Russia. *Source* Compiled by the authors

Fig. 2 Why you should become a member of a cooperative. *Source* Compiled by the authors

class, as the basis of society, is no more than 30%. In turn, the principles of cooperation are aimed at mutual understanding, trust, assistance, responsibility, education of a new generation in the spirit of modern entrepreneurship and quality of life.

3 Results

What needs to be done to increase the number of cooperatives in Russia and increase confidence in them? We understand that in an age of digital economy and a huge information field, everyone has the right to choose their own lifestyle. But at the same time, in our opinion, Russia was and is, a public–private system of management and management. Today, more than 20 million people are officially living below the poverty line, with unofficial estimates of up to 40 million. The wage ratio of poor to rich is 1:50, and possibly more (Table 1). At the same time, in developed countries of the world, the middle class in society is 60–80%. The development of society in the future with such indicators in Russia can lead to unpredictable social consequences.

What should be done? Institutions of government today should pay attention to cooperation, when people themselves, through the cooperative, will provide themselves with a workplace and social benefits. It is necessary to change the state policy regarding all types of cooperatives and recognize them as socially necessary structures in the development of the Russian economy. How to restore public trust in cooperation? First of all, there should be a conscious interest on a mutually beneficial basis through affordable lending and social benefits and successful state-cooperative partnership. Secondly, it should be fashionable in society to be a member of a cooperative and the state should promote this. The population should be trained in cooperative business through competence centers and educational institutions. Cooperation

Table 1 Social structure of Russian society in 2017

Social structure of Russian society	Share (%)	
Rich	5	
Middle Class	32	
Income poverty line	21	63
In near-poverty line	17	
Poor	25	
Total	100	

In economically developed countries, the income ratio of 10% of the rich and 10% of the poor is 7–9 times, while in Russia this figure exceeds 50

Source Compiled by the authors on the basis of the research of academician Osipov G.

should be present in the adopted twelve national development projects of Russia. A road map for an "Effective Cooperative Owner" should be developed.

If we talk about rural areas, first of all it is the effective use of agricultural land and the formation of a new economic mechanism for working in the countryside.

In the Russian Federation today, only three banks work with rural territories out of 442 present on the market. And we see that banks are not ready to take risks and work in the countryside. In our opinion, the need to create a cooperative credit land bank that will finance, control and manage the land resources of Russia is ripe.

At all stages of the development of market relations, the main role is played by a competent and competent specialist. The roadmap provides for the search and training of new entrepreneurs. Today, new owners should appear for the development of rural areas. Any citizen of Russia can start a business if he is ready to move to the village. Cooperation should become its reliable partner. Formation of new economic system and matrix of production, financial, economic, management, legal and market mechanisms of regional, regional and federal level. At the same time, it is necessary to pay attention to the main owner of cooperation—the shareholder. It should be beneficial to be a member of the cooperative, receiving benefits in the form of goods and services. A shareholder, as a member of a cooperative, is part of a middle-class social group.

4 Conclusion

In the development of cooperation, the Government should see all types of cooperatives, including consumer agricultural, production, credit, supply, garage, garden, etc. This is due to the fact that each territory of the Russian Federation has its own specificity for the development of cooperation. In the republics of the Russian Federation, the consumer cooperation of the Central Union has been preserved and is actively

working, and consumer and garden cooperatives, etc., are successfully operating in the Moscow Region.

The main problem of our time is ecology. Through the cooperative system, it is easier to preserve the environment.

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Public-Cooperative Partnership—New Forms of Development

Dmitry I. Valigursky, Vera K. Romanovich, Valentina V. Bronnikova, Victoria A. Kolenova, and Vyacheslav V. Karplyuk

Abstract This article is devoted to the improvement of cooperative entrepreneurship in rural areas as part of the development of the Russian economy in the near future. An analysis of the modern state of cooperation in rural areas is carried out and indicators of the activities of small enterprises and individual entrepreneurs for certain types of economic activities in the Russian Federation for 2019 are given. Based on these data, the creation of the "Central Consumer Digital Cooperative" was proposed, the essence of which is to organize active entrepreneurs to work in the countryside and create new jobs. The "Central Consumer Digital Cooperative" can solve several issues at once—the creation of new ones and the return of old owners in the countryside and solving issues of food security of the country. The article proposes a structure for organizing the activities of the Central Consumer Digital Cooperative, which involves both vertical and horizontal control links. This will be a new economic mechanism for the life of rural areas. The conclusion is that the "Central Consumer Digital Cooperative" can become the basic enterprise of the state within the framework of state-cooperative partnership, where social issues, the creation of new jobs, the development of entrepreneurship, as well as the provision of food to the population will be resolved.

Keywords Cooperation · Digital economy · "Central consumer digital cooperative" · Quality of life · Rural areas

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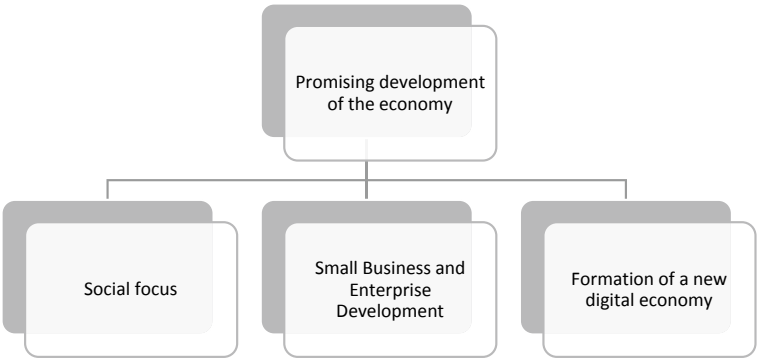

Fig. 1 Directions of economic development. *Source* Compiled by the authors

JEL Code P13

1 Introduction

During the period of development of a market economy where price, demand, supply are competition are integral parts, we often forget about the social significance and protection of certain categories of Russian citizens. During the period of development of Russia up to 30 years, the President of Russia defined three directions for the development of economies (Fig. 1).

1. Social development of society
2. Small Business and Enterprise Development
3. Development of the new digital economy.

The essence of each direction is, first of all, the development of entrepreneurship and the protection of the low-income population by providing them with social benefits. But this is possible only if small businesses develop in all areas of the economy, including in rural areas. The digital economy gives us an advantage in the information field and the search for new ideas, investments for the quality of life of the enterprise and the quality of life of the person. In turn, the quality of life of the enterprise is its competitiveness in the market of goods and services and the creation of new jobs, the opportunity to develop new types of activities. The quality of life of a person is well-being, it is the way of life and life expectancy.

2 Methodology

Analyzing these concepts and content, we understand that cooperation is the system that will be in demand today and in the future. The goal of cooperation is not profit, but

rather to satisfy the needs of shareholders—members of the cooperative. Analysis of the activities of cooperatives in Russia shows that all cooperatives are disconnected, each of the types of cooperatives builds its own policy, competes in the market of goods and services with private and public business.

The degree of scientific elaboration of the problem of this study can be defined as high—works are devoted to its study, such as: Stefanov and Valigursky (2016, 2019), Arustamov et al. (2020), Maslova et al. (2020), Valigursky et al. (2019a, b, c, 2020a, b, c), Valigursky and Kuzmina (2019), Valigursky (2016), Kuzmina et al. (2019), Mareeva (2018) and Gavrilyuk (2019).

The essence of cooperation is its principles, and the principles for all cooperatives are the same. It turns out a strange model. When each individual cooperative tries to resist the entire market, namely consumer cooperatives—serving the population, agricultural cooperatives production of agricultural products, production cooperatives—production of goods and services, credit cooperatives—competition with banks, etc. We understand that none of them is able to compete with private capital, monopolies and the state. Probably, at the moment it is beneficial to the state, but in the future we see that the tasks are different. The most unreliable player in the market is the state itself. He has many responsibilities and everyone expects help from him. Not because the state is bad or good, because it is difficult to manage the market with weak "institutions" of power.

In this regard, in our opinion, it is possible to transfer part of the socially significant problems to cooperation, which in historical development has always been the older brother of the state.

First of all, the national rural development project should be based on the cooperation of all sensible and entrepreneurial structures in the village and, through the system of cooperation, manage the economy, land, food, labor resources, taking into account existing legislation.

The amount of food that can be produced in Russia should become the basis for saturation of the domestic market and exports of the Russian Federation. To date, Russia exports $20 billion worth of food, including $17 billion worth of grain. According to the instructions of the President of the Russian Federation, by 2024 this figure should be $44 billion. This suggests that it is necessary to radically change the entire system of economic mechanism that exists today in rural areas.

The number of small enterprises by certain types of economic activity in the Russian Federation amounted to 2 million 659 units, the number of employees amounted to more than 11.8 million people, the turnover of these enterprises amounted to 53,314,227 million rubles. The performance of individual entrepreneurs in certain types of economic activities indicates that their number in 2019 amounted to about 6 million people, the volume of revenue from the sale of goods and services amounted to 15,007,290 million rubles. At the same time, there are 22.5 million personal subsidiary farms and more than 220 thousand peasant farms and more than a thousand cooperatives in Russia. No country in the world has such a multidimensional rural food production structure. These structures need to be managed and managed.

3 Results

One of our proposals is the creation of the "Central Consumer Digital Cooperative" which will include agricultural holdings, agricultural cooperatives, consumer, credit cooperatives, peasant farms, personal subsidiary farms, individual entrepreneurs and representatives of local self-government. The structure of the cooperative will depend on the territory where it will be formed. But its essence is to organize active entrepreneurs to work in the countryside and create new jobs.

But how to return youth to the village? In our opinion city dwellers need to provide to everyone free of charge land plots on a contractual basis depending on a type of activity (livestock production, crop production, beekeeping, fish breeding, etc.) for 10 years with the right of receiving in property if they remove into the country. Having become members of cooperative as businessmen, they obtain an interest-free loan for construction of the house, a farm, purchase of the equipment, infrastructure. Return of this loan is carried out not in terms of money, and in natural products which the businessman reports to cooperative. The cooperative returns a loan. In that case the businessman will be interested in increase in production and acceleration of return of this loan, but the problem arises in another where to put all that he will make. In this regard the cooperative itself has to have the material and technical resources on storage and processing of these products, but the most important it has to have advantage among other commercial structures on participation in government procurement and tenders. The essence of the offer is a creation of new owners in the village and an opportunity "to wake up" the old ones (Fig. 2).

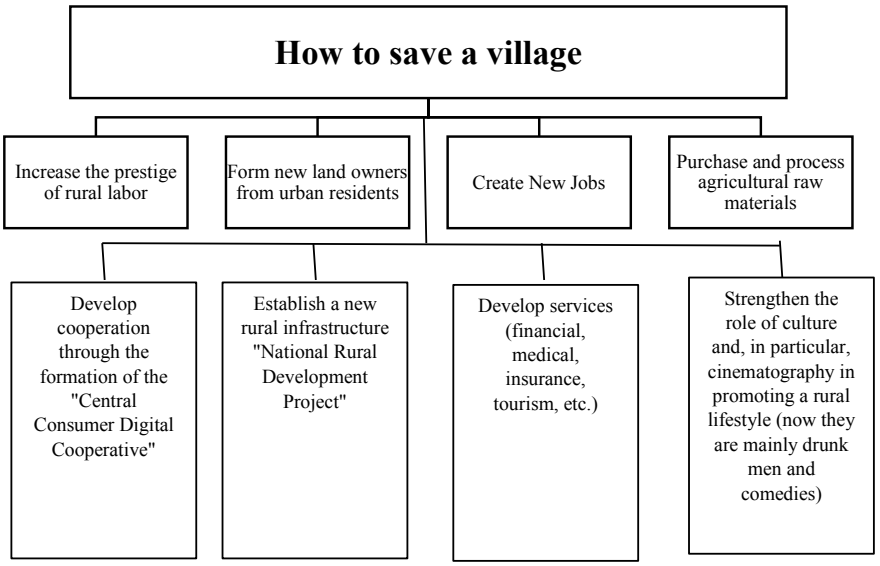

Fig. 2 How to save the village. *Source* Compiled by the authors

At the same time, another issue is being solved—a very important issue in Russia. This is the food security of our citizens to provide them with food according to scientifically justified standards. In general, a correct horizontal and vertical system of rural development management is obtained (Fig. 3).

The state, through all institutions of government, helps to develop cooperation along the vertical line of government, and the horizontal line of management allows uniting rural entrepreneurs, which will make it possible to introduce additional agricultural land into circulation, create new jobs, overcome poverty and raise the social level of rural residents. For the development of rural areas, all sectors of the national economy will be connected, including mechanical engineering, chemical industry, transport, processing industry, construction and various types of services. This will be a new economic mechanism for the life of rural areas.

In order to work in the proposed new system of the management mechanism, it is necessary to pay attention to the training of specialists in this field. It turns out a paradox. The state in 2020 allocates 37 billion rubles for the development of

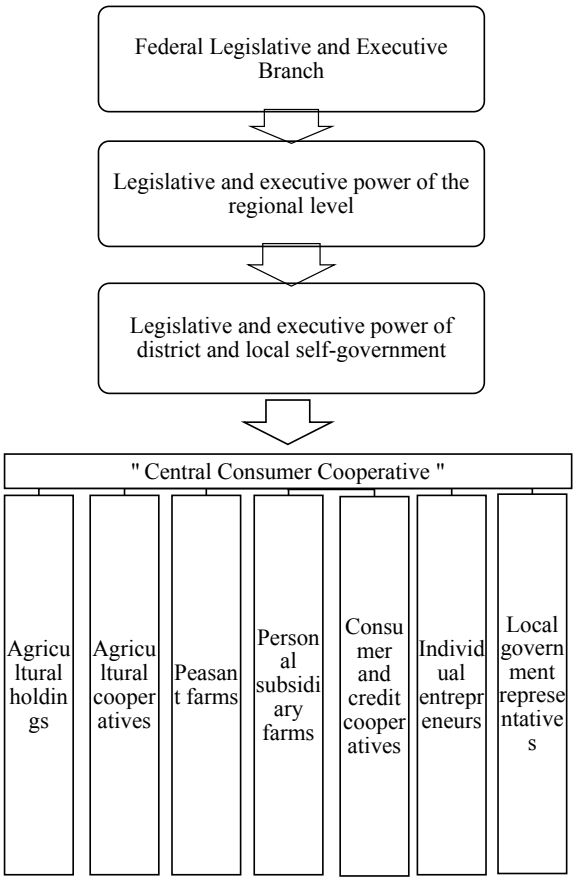

Fig. 3 Horizontal-vertical management system of the Central Consumer Digital Cooperative based on public-cooperative partnership. *Source* Compiled by the authors

agricultural cooperation. However, not a single university in Russia trains specialists in cooperative business.

The state gives money to agricultural cooperatives for their development, but exactly five years later the purchased equipment, machines, equipment of cooperatives passes into private capital.

At the end of the first stage of development of agricultural cooperatives (within 10 years ago), out of 7,021 newly formed cooperatives, only 10% remained closed or went bankrupt.

Modern realities make adjustments to the economy and everyday life. Soon we will wake up with other values and other economic policies, and food security issues are becoming more urgent.

4 Conclusion

In conclusion, it should be noted that the "Central Consumer Digital Cooperative" can become the basic enterprise of the state within the framework of state-cooperative partnership, where social issues, the creation of new jobs, the development of entrepreneurship, as well as the provision of food to the population will be resolved. Due to trust and mutual understanding between people in the cooperative, the territorial integrity of Russia, nationality, cultural traditions will be preserved, this will make it possible to raise the economy to a higher level of development.

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Some Aspects of Criminal Law Assessment of Property Damage to Corporate Entities

Andrey A. Klyuev, Tatiana V. Martynova, Tatiana V. Pilyugina, and Irina A. Yakovenko

Abstract The purpose of this work is to consider complex issues of criminal legal assessment of the infliction of property damage to corporate entities, which are caused by deception or abuse of trust. In accordance with article 2, paragraph 1, of the Criminal Code, property is an important object of protection against criminal attacks. She is listed by the legislator, among the most important tasks and placed in second place, after the rights and freedoms of the individual, which emphasizes her importance. If we turn to the data of the judicial statistically, it should be noted that over the past few years in Russia criminal encroachments on property account for more than half of all recorded crimes (their share is about 55%). Despite this situation of affairs, indicators of property damage to corporate entities, committed through deception or abuse of trust in the general structure of attacks against property, occupy a small number. In 2019, 102 criminal cases were considered by Russian courts, under article 165 of the Criminal Code of the Russian Federation. However, such statistics do not reflect an objective situation of affairs, since the criminal assault in question is highly latent. Many criminal attacks, where the perpetrators use criminal attacks such as deception or abuse of trust, are often not registered. The methodological basis (methodology) of the article was the provisions of materialistic dialectics as a universal method of cognition. Such private methods as: formal-logical, system-structural, statistical, sociological. The theoretical significance of the results of this study is manifested in the development of approaches for the assessment by practitioners of the harm caused to cooperative associations related to their activities. The work will help to ensure that cooperative actors are poorly protected from various types of negative processes.

Keywords Property damage · Harm · Crime · Corporate entity · Property

JEL Classification K14

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1 Introduction

The most difficult points related to the establishment of signs of the composition of causing property damage to corporate organizations are due to the characteristic of objective signs, which are established in article 165 of the Criminal Code of the Russian Federation. The criminal assault provided for in the above-mentioned norm is possible both through active criminal conduct (action) and passive (inaction). This can be supported by the opinion of Russian scientists. Therefore, in his study, A.V. Kovalchuk points out that in 67.8% of cases of qualification under article 165 of the Criminal Code of the Russian Federation there was a criminal act in the form of an act and in 32.2%—in the form of inaction (Kovalchuk 2015). The materials of criminal cases that we collected during this study indicate that the act is more often carried out in the form of an action, when the perpetrators, entering into confidence behavior, attract the property of other persons, which they later use for their own purposes. As for inaction, it occurs in situations of non-payment of funds for the implementation of certain actions by victims.

We fully agree with the statement of E.A. Babushin that, by carrying out criminal behavior, the perpetrator will prevent the fact of various types of property from entering the victims' fund, in our case corporate entities, and therefore the mass of property in this fund is reduced (Babushkina 2012). Such a description covers the full range of criminal conduct that may occur to varying degrees in practice.

Most often, scientists, based on the materials of judicial practice, recognize that a criminal act, being a form of a socially dangerous act prohibited in article 165 of the Criminal Code of the Russian Federation, is present in situations related to unlawful access to property by the guilty person, the result of which is a violation of the interests of the owner or other owner of the property of cooperative entities. In such a way, in his study, A.I. Rosenzweig believes that as an example of performing actions to be qualified under Article 165 of the Criminal Code of the Russian Federation, it should be recognized to attract funds or other property to form funds at the expense of the owner or other owner of the property (Rosenzweig 2012).

As we have indicated above, the commission of a crime occurs through inaction. At the same time, G.V. Verina connects this form of criminal behavior with the non-payment of those payments that are recognized as mandatory for the perpetrator, as well as by concealing information to be transferred to the victim when they constitute the basis for recovering funds from the perpetrator (Verina 2012).

Of course, the main indicator that the legislator includes in the criminal law norm is criminal consequences. Both in the name of the corpus delicti and in the disposition of the criminal law norm there is such a consequence as causing property harm. At its onset, the crime will be recognized as over. The consequences make it possible to judge the nature and degree of social danger of the criminal attack committed, which will ultimately affect the imposition of criminal punishment. As for the corpus delicti before us, the consequences in it have a property component. At the same time, the legislator does not connect the crime with any negative deprivations of cooperative organizations, but only with those that are associated with a certain amount of money

or equivalent. By Federal Act No. 420-FZ of 8 December 2011, the legislator limited the criminal consequences of the criminal act before us to major damage. If you refer to the content of note four to article 158 of the Criminal Code of the Russian Federation, then such damage is the amount of two hundred and fifty thousand rubles, as well as the amount exceeding it. Thus, there was a partial decriminalization of criminal assault.

Some domestic scientists believe that there are some difficulties due to a clear understanding of the extent of the negative consequences that are regulated by the legislator as part of causing property damage by deception or abuse of trust. These difficulties led G.A. Rusanov to the idea that the corpus delicti described by the legislator in article 165 of the Criminal Code of the Russian Federation should be decriminalized, since it is not among the crimes against property, in view of the complexities of the consequences of the crime, which are not directly related to the attitude of property (Rusanov and Aryamov 2018). Such an opinion is well founded.

The theory of criminal law has not developed a unified approach to the issue of the content of property damage caused by the unlawful actions of the guilty person. From the point of view of civil law, the negative result of a property nature is expressed in its two manifestations—causing real damage and unearned income. This approach has led to the fact that some criminologists who consider the composition of causing property damage by deception or abuse of trust, and such a majority, take the position that the consequences are expressed only in the form of lost profits. Others nevertheless suggest that the consequences of the crime be considered in its classical sense, applicable to all crimes against property without exception (Gaukhman and Maximov 2001).

In our view, it is unlikely that the corpus delicti should be carried over by causing property damage through deception or abuse of trust from the head of the crime against property. In order to eliminate the existing contradictions, it would be necessary to characterize in a slightly different way the range of actions (inaction) falling under the criminal law ban. Of course, their result should be negative property results, but the fact of illegal seizure or circulation of someone else's property should not be established.

An example of real harm to victims of the actions of the perpetrator, qualified under article 165 of the Criminal Code of the Russian Federation is the following criminal case.

According to the protocol of the general meeting of the founders of the housing and construction cooperative, V. S.V. was elected its chairman of the board. His duties included making financial decisions that were certified by his signature. The duties of V.S.V. in accordance with the charter approved by the general meeting of the founders of the housing and construction cooperative included the following: general management of the activities of this association, financial activities, and others.

V.S.V., in order to attract citizens' funds, began to conclude contracts with persons wishing to purchase both residential and non-residential premises in the house under construction to finance the construction of the house. The victim No. 14 turned to V. S.V., who was the chairman of the housing and construction cooperative with the aim of acquiring residential premises in the house. Acting in pursuance of his criminal

intent, V.S.V., as chairman of the board of the ZhSK, concluded an agreement with the Victim No. 14, where the object was the object of shared construction. According to the terms of such, the ZhSK developer undertook to complete the construction in accordance with the requirements of the SNiP and introduce an apartment building on a land plot with a total area of 1,251 m^2, after which he transferred to the property Victim No. 14 with an area of 37.1 m^2, worth 1,855,000 rubles.

The money received in the amount of RUB 1,855,000 was ordered at discretion of V.S.V, the obligations undertaken to formalize the ownership of the Victim No. 14 of the apartment specified in the contract did not fulfill, which caused the latter material damage on an especially large scale.

Damage as a negative result of the commission of a criminal act in the form of causing property damage by deception or abuse of trust to cooperative organizations is manifested not by the transfer of certain objects recognized as property; material distortion of the value of property used by the perpetrator for personal interests and others. If we consider the situation where there is a lease of equipment, a ship or a car with the subsequent non-transfer of rental payments to the owner, as well as when the culprit uses the property (transport, equipment) provided to him for purposes, while illegally reducing the value of this property, the consequences are determined by both the amount of failure to receive due and the value of the property itself.

Results of the research. When determining the amount of consequences in the form of property damage, it should also be borne in mind that in the absence of the transfer of property to the owner, the latter does not always lose control over it, since it may remain with it; the damage determines the income not received. This leads to the idea of the significant difference not only in the content of these consequences, but also in the degree of their social danger, which affects the criminality of criminal behavior.

According to the authors, when real damage occurs to cooperative associations associated with a decrease in the value of property owned by the victim, various kinds of additional financial costs are required due to an infringement on property. At the same time, any disposal of property from the possession of its owner is always associated with the impossibility of using it, and therefore obtaining possible property advantages. Therefore, real damage is often associated with lost profits.

In order to correctly and clearly determine the nature of the consequences of the corpus delicti provided for in article 165 of the Criminal Code of the Russian Federation, we will understand what is meant by lost profit. Scientific civilists, taking into account the legislative definition, come to the conclusion that lost profit is a loss in the future (Biocov 2008). Both real damage and loss of profits are associated with a breach of contractual obligations. However, loss of profit compared to real damage is always associated with a certain abstract value, which causes some difficulties in its definition and the process of proof.

If we turn to the laws of formal logic and apply a grammatical interpretation, then the terms “lost profit” and “not receiving due” will act as synonyms. Both of these terms are associated with a set of materiel that the battered person does not receive in connection with the unlawful behavior of the counterparty. In view of this, the definition of one concept through another seems not entirely consistent and correct.

As for the size of the consequences, as we have already indicated, it is associated in part 1 of article 165 of the Criminal Code of the Russian Federation with a large size that exceeds two hundred and fifty thousand rubles, as well as a particularly large size (part 2 of article 165 of the Criminal Code of the Russian Federation), which in total should exceed one million rubles. It should be borne in mind that, in the presence of several victims, but using the same mechanisms of criminal conduct, the amount of guilt is determined by the harm to several victims (the crime is recognized as continuing).

2 Methodology

The methodological basis of the work was the provisions of materialistic dialectics as a universal method of knowledge. Such private methods as: formal-logical, system-structural, statistical, sociological.

3 Results

From the authors' point of view, an important point in consideration of the issues of protecting the property of cooperative entities from causing property damage in the absence of signs of theft is the study of questions of an objective nature. It should be made clear how criminal acts had occurred. It is important that the perpetrators do not take direct action to seize property belonging to cooperative entities. In the presence of the latter, the act should be considered as fraud and qualify behavior under article 159 of the Criminal Code of the Russian Federation, and not under article 165 of the Criminal Code of the Russian Federation.

Consideration of the content of the disposition allowed the authors to conclude that it was legally difficult to determine such important concepts as "property owner" and "other property owner." When property damage is caused to cooperative organizations, the owner only has direct adverse consequences, while another person whose property was even lawfully located does not have direct consequences.

The authors believe that there is a need for a significant expansion of the concepts of "owner" and "owner" used in criminal law. To this end, an additional paragraph should be included in the Decision of the Plenum of the Supreme Court of the Russian Federation No. 48 of November 30, 2017 "On judicial practice in cases of fraud, misappropriation and embezzlement."

The authors also believe that in the disposition of article 165 of the Criminal Code of the Russian Federation, the legislator actually provided for a specific, compared to other attacks on property, subject of the crime. It includes both the property owned by the owner itself, which in one part or another is used by the perpetrator, and the money itself, which must be transferred to the owner or another person, which the owner will indicate in order to fulfill its obligations.

4 Conclusion

All the above points out that the criminal law provisions on the infliction of property damage by deception or abuse of trust without evidence of theft require further study both in terms of legislation and law enforcement practice, which will contribute to improving the effectiveness of counteracting this negative phenomenon.

When consideration of issues, the qualification of property damage to cooperative entities through the use of deception or abuse of trust must be combined with objective and subjective circumstances, which will avoid violation of the law.

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Challenges and Prospects for Public–Private Partnerships in Light Industry in a Pandemic

Ksenia A. Nefedova, Irina V. Naumova, Svetlana V. Nikiforova, Elena N. Gorbatenko, and Elena Yu. Smirnova

Abstract The article describes the results of the research, the purpose of which was to analyze the impact of the pandemic on the development of public–private partnerships in light industry, as well as to assess the prospects for the development of this industry when implementing the PPP mechanism. The research used comparative analysis methods, synthesis, a systematic approach to evaluating data, as well as a dialectical method. The article assesses the problems and directions of light industry development in Russia, identifies the main factors that hinder the modernization of industrial enterprises in this industry. As one of the solutions to the identified problems, the use of a public–private partnership mechanism was proposed. The main factors that hinder the development of the PPP institute in Russia, as well as factors that contribute to its development in light industry in the conditions of the spread of corona-virus infection, are grouped. Currently, experts note that the use of traditional methods of supporting and developing light industry enterprises does not always allow achieving the necessary result. Research in most countries shows that, compared to conventional methods, PPP is indeed a very effective way to maintain and ensure the development of enterprises in the industry in question. Public–private partnership is of particular relevance in the implementation of large-scale projects that require substantial funding, including from extra-budgetary sources (Shvelidze

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Scientific Notes of Young Researchers 2:46–54, 2016). The work determined that public–private partnership has prospects for the implementation of projects in light industry, even in the conditions of the emergence and development of corona-virus infection.

Keywords Pandemic · Light industry · Public–private partnership · Investment · Development

JEL Classification L67

1 Introduction

Considering the world system of light industry, which has formed over the past 20 years, all countries, depending on specialization, can be conditionally divided into three groups. The first group including world suppliers included the developing rather poor countries (Vietnam, China, Turkey, India, Bangladesh) which main driver of economy is the continuous growth of a share in the world market of the textile and shoe industry. The second group was formed by regional suppliers, bringing together medium-development countries and providing products for themselves and near regional markets. This group includes such states as Romania, Bulgaria, Poland, Hungary and the Czech Republic. Finally, a third of the group are importing countries with high incomes and ancient labour costs. A distinctive feature of these countries is that they can import all light industry products without harming their economies. Along with the USA, Great Britain, Germany, France and Japan, Russia also joined this group. Unfortunately, despite the fact that back in the 2000s our country was really able to fully provide itself with light industry products, at present its imports amount to about 90% sales. In order to be able to reverse the situation, a comprehensive approach is required from all market players—the state, enterprises and private investors (Gordeev 2017).

2 Methodology

In order to identify possible prospects for the development of light industry enterprises in the context of the spread of corona-virus infection, it is worth referring to the experience of foreign countries, as well as assessing the potential demand for various types of products produced by enterprises of this industry. A number of domestic and foreign scientists are currently studying such issues. In addition, various scientific studies are carried out and statistical data are formed that allow assessing the prospects for the introduction of certain areas of development of light industry enterprises.

The analysis of the results of a number of studies showed that due to the fact that light industry enterprises do not have enough own opportunities for the qualitative development of exports of products, it is necessary to ensure the development of

targeted state policies in this area. The key measures of state support for light industry at the moment can be identified:

- providing financing for activities aimed at promoting products in domestic and foreign markets;
- providing budgetary financing of research in various industries;
- subsidizing interest rates on loans for the purchase of fixed assets of production and its modernization.

The current state of light industry enterprises, provided that the state provides support, will achieve a higher level of development of the industry, as well as form the interest of the business community and encourage them to participate in this type of business. At the same time, do not forget that one state support for the integrated development of the industry will not be enough. A number of appropriate measures should be taken at the level of light industry enterprises themselves. The basis for the formation of these measures should be the "Strategic Research Program of the Technological Platform" Textile and Light Industry for 2013–2020 "(look at the Table 1) (Strategic research program Technological platform 2013).

Table 1 Directions of textile and light industry development

Directions for the development	Examples of direction content
Search for products that are different from the main application directions	• Protective tissues used for chemical and biological effects • Textiles intended for medical needs • Fire-retardant clothing
Development of "Smart fabrics" production based on improvement of production processes	• Smart Shirt—a type of textile created to improve the quality of life, while reducing health care costs • Smart Shirt—body armor, artificial muscles, biochemical analysis of security hazards, physiological location monitoring, built-in communications and computing • E-Textile with classic electronic device and modern electronics built into textile fibers
Use of new technologies to improve the quality and competitiveness of textiles	• Hollow siliconized highly sculpted fibers, which retain heat and volume, which will be in demand in the production of bedding, soft furniture • Non-combustible, antimicrobial hollow highly sculpted fibers • Colored fibers and fibers with a regenerated polymer content (up to 40–50%) • Conductive fibers with linear resistance up to 104 Ω/cm • Bicomponent fibers of different configuration

Source Compiled by the authors

In order to introduce these technical and technological solutions into light industry, it is necessary to carry out a comprehensive modernization of production facilities. The main directions of this modernization should be the development of intersectoral cooperation, carried out on the basis of the formation of industrial clusters, as well as the technical re-equipment of production lines. Given the high capital intensity of light industry enterprises, the modernization of the industry requires:

- Significant investment resources, which, according to experts, can vary from 170 to 180 billion rubles;
- Making long-term loans available to light industry enterprises, including foreign banks, ready to provide long-term loans at low interest rates;
- Creation of sector regional leasing companies on the basis of public financing.

3 Results

In the current economic and legal conditions, the implementation of these areas is often possible only with the development of public–private partnership programs. In a situation characterized by insufficient regional financing, as well as a decrease in the share of transfers allocated for the implementation of investment projects from the federal budget, the development of the PPP institute becomes especially relevant. In addition, the high need for modernization of obsolete production facilities, again prompts light industry enterprises to turn to the search for extrabudgetary sources of financing. From our point of view, the implementation of projects based on the application of public–private partnership can attract the necessary investments, create new jobs and, as a result, economic growth in this industry (Petrukhin et al. 2019).

At the same time, the process of attracting private investment in light industry in modern conditions is hindered by the following circumstances:

- There is a shortage of guarantees from the State and light industry enterprises themselves on the return of investments invested in projects;
- The amount of funds required for the implementation of projects involving private entities is significantly higher than the amount of security provided;
- The current level of financial management development does not allow private investors to fully exercise control over investment projects implemented on the basis of PPP;
- Low investment attractiveness of light industry projects due to low return on capital investments;
- High level of capital intensiveness of projects implemented in light industry at low capital turnover rate;
- Significant dependence on natural climatic and territorial conditions (Dmitriev et al. 2018).

Another obvious problem when implementing projects using public–private partnerships is that all of them are mainly implemented by large enterprises. At the same time, medium-sized and even smaller businesses do not have the ability and

leverage to attract private investors based on PPPs. In our opinion, the solution to this problem lies in the formation of an effective mechanism of interaction between the enterprises of large, small and medium-sized businesses themselves. From the experience of many European countries, it can be noted that a multi-level system has shown its effectiveness, in which small enterprises operate on a medium-sized basis, and medium-sized enterprises, in turn, provide work for large enterprises and corporations. Thus, the solution to the problem with the "lopsided" participation of private investors in our country can be solved by mandatory inclusion of small and medium-sized enterprises in the production chains of large companies (Volkova 2017).

In the current context of the spread of coronovirus infection, the introduction and development of PPP mechanisms is of particular importance, since the issue of attracting extrabudgetary funding is more acute than ever. In order to ensure the interest of business structures in investing, including in the light industry, the government has prepared a number of amendments to the legislation to protect the interests of private investors in the implementation of PPP projects.

One of these areas of support for public–private partnership was the consolidation of the form of budget participation and the institution of special obligations that reduce risks for each of the parties involved in the implementation of the project. Another equally important innovation is the possibility of compensating for the costs of preparing a private concession initiative. Important is the fact that the bill considers the requirements for bidding in electronic form, as well as the provision to the Ministry of Economic Development of certain powers in the field of public–private partnership. All the initiatives proposed by the bill will eliminate the gaps in the current legislation and minimize the risks associated with challenging agreements by courts and supervisory authorities. In turn, all of the above should contribute to the strengthening of PPP-based projects (Zakharova 2020).

Unfortunately, in the situation of the spread of coronovirus infection, the volume of attracted investments with the participation of private investors in the form of PPPs returned to the level of 2010. Back in the spring, more than 340 projects implemented under concession agreements, public–private partnership agreements (PPP) or municipal-private partnership agreements were at risk due to the pandemic, the fall of the ruble and the slowdown in the economy (Galcheva 2020).

Light industry was no exception. A study conducted by the International Federation of Textile Manufacturers (ITMF) noted that on average, there is a decline in demand for textile products in the world. Since March, orders in the textile industry of foreign countries have decreased by 35–60%, especially in Romania, Italy, Spain and France. In addition, there were delays in deliveries, due to which productivity fell by almost a third (https://kachestvo.pro/kachestvo-upravleniya/svoy-put/covid-19-novye-vyzovy-dlya-legproma/). Among the main problems in Russia's light industry are the following:

- reducing demand, both domestically and externally, for most products (not including medical products);

- temporary production outages: due to restrictions on movement, workers cannot get to jobs;
- massive cancellations and/or postponements of existing orders, lack of new incoming orders and uncertainty about the future;
- interruption and/or delay in the supply of raw materials and components: one of the largest suppliers is China, where many industries have stopped their work, in addition, tightening sanitary inspections in transit countries contributes to the delay in the shipment of goods;
- disruption of logistics links and the international supply chain (value), which leads to an increase in cost and makes production inefficient;
- the decline in sales and income of enterprises leads to a lack of working capital, obsolescence of products and the occurrence of delays in the payment of wages, taxes and other payments;
- liquidity problems—lack of additional capital to support production;
- difficulties in the implementation of investment projects involving foreign investors caused by a failure in the supply of equipment from abroad and the arrival of foreign specialists;
- difficulties in transporting finished products, raw materials, semi-finished products during export: in most countries, the timing and cost of supplies increased sharply, in addition, many shopping centers and enterprises—the main importers of light industry products—were temporarily closed.

All this, of course, leads to a decrease in the share of projects implemented using PPPs. At the same time, it is light industry, due to a number of circumstances and specifics of the products produced, that can be called the most resistant to changing conditions due to the spread of Covid-19.

Because the pandemic has seriously accelerated many processes, such as obtaining certificates for the sale of goods, enterprises have an additional opportunity to master new types of production. In our opinion, in the next few months, and possibly several years, the most sought-after goods will remain:

- masks and personal protective equipment;
- work wear for work in the most infected areas;
- bedding and towels for the hospital fund, including disposable ones, which, due to higher processing requirements and increasing incidence, will become unusable faster;
- disposable clothing (operating and night shirts, hospital robes, etc.);
- technical textiles, rags and other cleaning equipment (due to increasing requirements for disinfection of public premises).

As another opportunity that has opened up to manufacturers of light industry products, it can be called that today many of the largest market players are looking for production facilities in Russia. A number of international companies, due to logistics difficulties and instability in the foreign exchange market, have decided to transfer their orders from China and other countries (Strategic research program Technological platform 2013). This is the principle that was followed by the UK. Despite

the fact that factories are now closed, retailers and brands are already moving their orders in local industries instead of China, thanks to which the industry's productivity will increase by an average of 20–30%. Under the circumstances, many retailers have revised the possibility of producing products from British manufacturers. In addition, experts from the British advocacy group Make It British, believe that British retailers and clothing brands will now focus on supplying their fabrics in the domestic market so that they have the opportunity to ensure all production within the country (https://profashion.ru/production/industry/tekstilnaya-promyshlennost-velikobritanii-demonstriruet-rost-vo-vremya-pandemii/).

4 Conclusion

Therefore, light industry in a pandemic situation can become one of the most sustainable industries for the development of public–private partnerships, due to both the priority of the products produced and the state orientation aimed at the development of these enterprises. The very mechanism of PPPs in light industry can become a kind of starting point in the development of relations between the state and private investors, which allows to supplement the strengths of state participants with the existing opportunities of business representatives.

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Features of US Corporate Control Market: Historical Aspect

Olga A. Romanenko, Tatiana V. Muravleva, Alla P. Vitkalova, Olga V. Dolmatova, and Lyudmila N. Shumilova

Abstract As part of the study of the problems of corporate control transformation, the article aims to study the nature of relations between shareholders and managers based on the documentation of aspects of ownership and control of ordinary shares of companies openly circulating on the stock market. As the methodological basis of the study, systematic and complex approaches, scientific abstraction, dialectical method of cognition, comparison methods, etc. were used. This research is aimed at studying the process of influence of equity owners on the activities of managers, which is guided by the creation of shareholder value. This aspect is related to corporate governance, the problem of motivation and control of the activities of managers who are not owners of the company to maximize the cost of corporations. The scientific significance is that the problems presented in the study of reviving the interests of shareholders and subsequent pressure on corporate managers can contribute to the development of financial science and serve for further theoretical and practical developments in the field of company management based on the concept of value maximization. The practical significance of the study is that the presented results can be used by heads of companies and business development departments, representatives of the business community, who embody management programs based on the company's value.

Keywords Market · Corporate control · Mergers and acquisitions · Assets · Shareholders · Managers · Profits · Value · Management

JEL Classification G 34

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1 Introduction

The problem of agency relations, which arises when sharing the functions of ownership and management and control, remains urgent for corporations, both in developed economies and in developing ones. Shareholders, as owners of companies, can only hope that a group of agents (hired corporate managers) will manage the company effectively, increase its value, and, therefore, increase the wealth of shareholders. Almost never does a shareholder's position allow it to require agents to act one way or another, or to refrain from certain actions. In order to analyze the nature of relations between shareholders and managers on the basis of transformations of corporate control, to identify the main problems of the influence of equity holders on the activities of managers is the main goal of this research.

2 Methodology

It seems possible to consider two sources of management discipline: the state of the US corporate control market in the 1989s, since it was during this period that there was a boom in acquisitions through debt financing, and the activity of institutional shareholders, which became a significant factor in the influence on the activities of corporate managers in the 1990s. It is these forces that have had the most significant impact on the fundamental change in the nature of corporate governance over the past two decades. Corporate managers took care of the interests of shareholders, which was the direct result of the pressure exerted on them. Managers were forced either to improve the efficiency of the company, or to correct the consequences of the opposite.

Economists such as Chol (1997), Guercio (1999) Romano (1993) have made a study of the problems of managing pension funds taking into account the interests of pensioners and portfolio capital of pension funds. Some aspects of the development of financial strategy, which led to the growing activity of institutional investors, are reflected in the works of Gillan et al. (2000, Gillan and Starks 1998), Opler and Sokobin (1995). Scientific works in the field of financial management touching on the problems of the concept of investment with the development of relations between shareholders and corporate managers are reflected in the works of Grundfest (1993, Huson (1997), Pound (1995). The research of processes in the US corporate control market is devoted to the works of economists Jensen and Meckling (1976), Kensinger and Martin (1996), Monks and Minow (1995), Nesbitt (1994).

3 Results

In the US corporate control market, a boom in borrowed acquisitions occurred in the 1980s. Companies engaged in such activities as Kolberg Kravis Roberts, for example, purchased shares in unlimited quantities, then sold parts of corporations, fired employees, after which they created small and more competitive companies through an initial public offer. Proponents of the trend said that such changes should happen a long time ago, and managers persisting in selfishness simply did not want or were not able to implement such a thing. Opponents regretted the transfer of funds from almost all interested groups to holders of ordinary shares.

The net profit of the takeover market in these years is likely to remain the subject of discussion over the next decades, but one thing can be said with certainty: the takeovers that took place served as a serious warning to the CEOs of even the largest companies. They had to think about the effectiveness of the company in the hope of raising the stock price in order to avoid the prospect of a hostile takeover. As a result, the activation of the corporate control market in the 1980s became an unprecedented factor in ensuring the discipline of corporate managers.

The merger market of the eighties collapsed after the collapse of the junk bonds market. Junk bonds were the result of Michael Milken's activities—they stimulated takeover transactions by providing large sums of money to potential takeover market specialists. When Milken and his company Drexel Burnham Lambert faced legal problems, the brokerage bond market collapsed, entangling the mechanism of the corporate takeover market. The collapse of the company's corporate control market is described in Mergerstat Review (1993), where it is reported that the peak of mergers of companies whose shares are traded on the public market occurred in 1988, when 462 companies were acquired. This figure then fell to 148 in 1991, while the number of tenders fell from 217 to 20.

Beginning in 1987, just when the takeover market began to collapse, several public employee pension funds led by the California Public Employee Pension System and the Wisconsin Investment Department began a company to actively attract portfolio companies, which entailed significant changes in the model of investment behavior of these institutions. Traditionally, they were passive investors who showed dissatisfaction with the financial performance of the company by selling their shares or refusing to buy shares, if they did not own them. The new active investment strategy was aimed at improving the efficiency of portfolio companies through the introduction of an active intervention program for institutional investors.

The growth of institutional activity is evidenced by two factors: the growth of institutional packages of ordinary shares, which took place between 1970 and 1990, and changes in the rules of the Securities and Stock Market Commission regarding shareholder relations.

One of the most important reasons for increasing the activity of investor organizations is their economic influence. Institutions control more than half of all shares traded in the public market and more than 20% of all US financial assets. Figure 1 illustrates the rapid growth of the United States institutional financial assets since

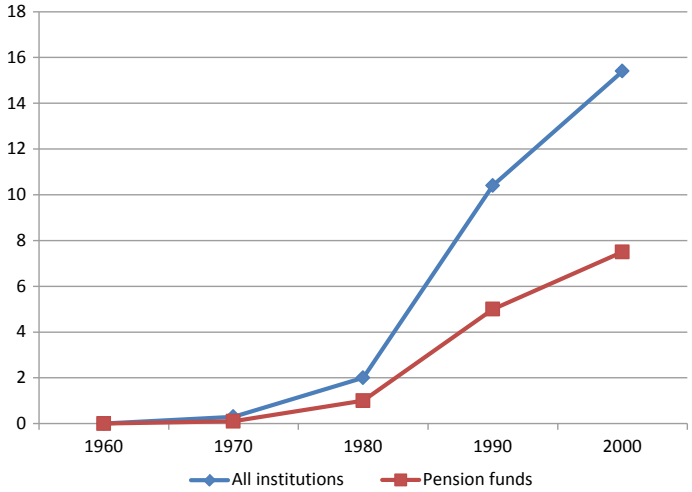

Fig. 1 Institutional ownership of US financial assets, 1970–1999 (trillion US dollars). *Source* Institutional Investment Report: Financial Assets and Equity Ownership, The Conference Board, August 1999

1970, when their total dollar value was only $672 billion. By 1980, the amount will triple and amounted to 1.9 trillion US dollars, and by 1999 the total value of assets exceeded 15 trillion US dollars.

The increase in assets controlled by institutions has been significantly reflected in the Pension Act of 1974 (ERISA). This law, in particular, has led to subsidies for private and public pension obligations. The administration of pension funds, not wanting to pay the promised pension benefits, fell under the jurisdiction of the US Department of Labor, and the funds had to be managed, taking into account, first of all, the interests of pensioners (Chol 1997). The latter requirement essentially deprived corporations offering pension plans of control over the assets of the pension system.

Table 1 provides detailed information on the growth of pension fund asset holdings between 1970 and 1999, classified by type of agency. The annual growth rate of total assets owned by institutions amounted to more than 20%. The annual growth rate of assets of pension funds, the largest independent group of institutional investors, amounted to 21.79%, which was the second largest indicator after the category of investment companies. Moreover, within the pension fund group, state and local assets grew the fastest during this period. The latter is particularly important because State and local pension funds have been most important for a new generation of active institutional investors.

The largest state-owned corporations were the first to experience an increase in institutional investment, whose shares and bonds became the basis of the pension fund's portfolio capital. Institutional holdings of the 1000 largest U.S. companies rose from 46.6% in 1987 to 57.6% in the third quarter of 1999 (Guercio et al. 1999). During

Table 1 Growth of assets held by institutions, 1970–1999 (US $ billion)

Types of institutions	1970	1999	Total annual growth rate (%)
Private, managed by power of attorney	112.00	4060.00	22.8
Private insured	40.80	1004.60	19.48
State and local	60.30	2344.00	22.55
All pension funds	213.10	7408.60	21.79
Investment companies	47.60	3396.30	26.76
Insurance companies	225.10	2537.40	14.41
Banks and trust—companies	186.80	1799.50	13.41
All institutions	672.60	15432.20	19.01

Source Institutional Investment Report: Financial Assets and Equity Ownership, The Conference Board, August 1999

the same period, institutional holdings of small-cap funds rose from 38% to 52% and above. In some industries, institutions control even a larger portion of the shares of member companies. For example, in the third quarter of 1999, institutions owned 73% of the shares of paper industry companies, and 55 cases were recorded (compared to four in 1987) when institutions controlled more than 90% of the company's shares. Obviously, institutions, especially pension funds, have achieved significant results in owning shares of American corporations.

There is another factor that has influenced the activity of investors of state and local pension funds—most of their share capital in securities successfully apply indexation strategies designed to minimize the costs of circulation and profit in the form of a certain index. Since indexation limits the ability of the fund manager to trade to increase portfolio capital profits, the decision to closely engage companies with low financial performance, whose shares are part of the institution's portfolio, is an adequate way to increase portfolio profitability. Table 2 shows the intensity of the indexation strategy used by some public pension funds.

The second key factor driving the growing activity of institutional investors was a review by the Securities and Stock Market Commission (SEC) of shareholder relations rules. Until October 1992, there were strict restrictions on investor communication with each other during the "power of attorney struggle." In accordance with previous rules, any communication with someone (other shareholders or members of the public) that could reasonably be considered as an attempt to influence decisions made by proxy vote was classified as a petition under Securities and Stock Market Commission Rule 14a-1 (1) (Gillan et al. 2000; Institutional Investment Report 1999). Some experts note that this provision falls under rule 14a-9, aimed at preventing fraudulent activity, and rule 14a-3, which provides for mandatory disclosure of claims.

Under the latter rule, motions were not permitted until formal notice of voting containing information set forth and approved by the Securities and Exchange Commission had been delivered to invited shareholders. All this means that, according to legislation, it was extremely difficult for independent institutional

Table 2 Indexing institutional investors, 1999

A. Indexing depending on the types of institutional agents		
Type of institutional investor		Indexed only (%)
Corporate pensions		15.2
Public pension funds		63.0
Mutual Fund Managers		10.1
Investment managers		11.8
Insurance companies		4.8
Banks		36.6
B. Degree of use of indexing by individual companies		
Pension fund	Percentage of equity portfolio capital	Total assets (%)
Cal PERS	78.1	48.2
NY State Teachers	81.9	57.8
California State Teachers	79.2	49.2
Texas Teachers	93.7	55.4
New York Common	65.5	35.1
Federal Retirement Thrift Board	100.0	53.5
Florida State Board	58.2	39.2
Total Top 25 Indexers	60.6	36.5

Source Institutional Investment Report. Turnover, Investment Strategies and Equity Partners, Volume 3, # 1, The Conference Board, January 2000

investors before 1992 to discuss issues related to the fight against powers of attorney. They would have to register a preliminary notice of voting with the Securities and Stock Market Commission, wait for the approval of the Commission, send formal notice of voting to all who are required to participate, and then be responsible for the actions taken in accordance with the provisions of rule 14 (a) to 9 aimed at preventing fraudulent activity.

On October 22, 1992, significant changes were made to the rules for communication between shareholders. The Securities and Stock Market Commission announced a reform of proxy case rules, which simplified communication between shareholders who did not seek the opportunity to vote by proxy directly. Simply put, rule 14a-2 (b) provides that the most independent shareholders may freely discuss with each other the struggle for votes.

An opportunity to freely discuss issues of the power of attorney and possession of the essential number of actions was turned institutional investors into the real force. Active institutions worked quickly, seeking to use current situation. Council of institutional investors got huge influence (Gillan and Starks 1998). Council gathered

twice a year in Washington and San Francisco for discussion of questions which concern all member companies. Participants in the majority are institutional investors, their number includes the pension funds for public servants, in particular, the known Californian pension system of public servants.

Main objective of active investors always was increase in profit of shareholders, but strategy over the years changed. For example, during the period from 1987 to 1989 the main attention of investors was concentrated on hostile absorption and the corresponding counter-measures. Since 1990 the efficiency of activity of corporation, in particular definition of reference points for the companies which couldn't provide competitive long-term profit the to shareholders comes under the spotlight.

At investment with development of the relations when investors actively communicate with the companies in which they invested the capital, quite long story. Investments of certain wealthy individuals or small groups into creation or reorganization of the company can be an example. In a sense, the concept of investment with development of the relations is similar to investment of the venture capital when the investor introduces the personal experience in the relations. The difference is that in the first case it is about investments into large corporations which actions freely are traded on the open securities market (Grundfest 1993).

Currently, the number of institutional investors using an investment strategy with the development of relations or institutional activity is extremely limited (Huson 1997). Among the most active institutions are CalPERS—the California Public Employees' Pension System and the Wisconsin Investment Department, the Teacher Fund Pension Association, the New York State Employee Pension System and the LENS Private Fund, Ins. Although the methods used by each of these investors may differ, the result is one. Basically, they establish personal relations with directors of dysfunctional companies invested from their securities portfolio and seek to make changes that, in their opinion, will increase the efficiency of the enterprise in the future.

Private funds supporting active ownership (e.g. LENS) have made some progress in attracting investment from public and corporate pension funds. For example, between 1995 and 1999, LENS invested approximately $500 million in Relational Investors, a fund whose strategy is to actively attract the corporate leadership of US open joint stock companies, whose effectiveness leaves much to be desired (Jensen and Meckling 1976). In 1999, CalPERS invested $200 million in the British Focus Fund, a joint venture between Hermes and active shareholder Lens Investment Management (Kensinger and Martin 1996). The British Active Value Fund received a huge amount of $800 million, mainly from North American institutional investors, and invested them in dysfunctional companies located in Northern Europe. In the UK, the fund has earned a reputation as an aggressor due to desire to change senior management and absorb companies in the event of a possible higher cost (Monks and Minow 1995; Institutional Investment Report 2000).

4 Conclusion

Summing up, it should be noted that professional managers control large companies whose shares are available to the general public, thus being trusted persons the owners of the company (shareholders). When the personal interests of the manager conflict with the interests of shareholders, an agency problem arises, that is, the manager can act in accordance with personal preferences, and not from the point of view of protecting the interests of shareholders. The manager makes key decisions regarding the markets where the company competes, the goods and services it offers, the price and marketing policies of the company, as well as its reactions to the actions of competitors. Therefore, from the point of view of the owners, the success of the company largely depends on the qualifications of the managers and their desire to make decisions consistent with the interests of shareholders.

Studies of the nature of shareholder relationships based on documentation of the ownership and control aspects of ordinary shares of companies revealed the problem of the influence of equity owners on the activities of managers aimed at creating shareholder value. The study was limited to the period of the 1980s and 1990s, since it was during this short time that the interests of shareholders revived and the subsequent pressure on corporate managers who faced a choice—to increase the efficiency of the company or face the consequences of the reverse process. The key factor characterizing the interests of shareholders during the 1990s was the growth of institutional investor activity, which followed the cessation of a wave of acquisitions at the expense of borrowed funds. The description of the working methods of some of the main active institutions proves their effectiveness in relation to the motivation of the company.

The influence of external uncertainty leaves the question of the predominant role of institutional activity in protecting the interests of shareholders. A significant category of financial institutions—state pension funds—are subject to political pressure from state authorities and other elected persons who set goals for funds that are not related to creating shareholder value. Since these goals force pension funds to put pressure on companies to perform certain social tasks, such actions negatively affect the results of activities. Today, facts indicate that in general, active institutions are coping with the task of improving the efficiency of companies. And only the future can show whether the situation will change.

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Problems of the Legal Status of Small Forms of Farming in Rural Areas

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Abstract The purpose of the article is analysis of the legal status of small businesses in rural areas, identification of legal problems of organizing and running small businesses in rural areas and proposing ways to solve them. The authors used legal methods for determining the problems of the legal status of small forms of business:

(1) Comparative legal. It is used to compare, characterize and identify the features of the legal status of a peasant farm, as well as agricultural cooperatives and business societies.
(2) Method of analysis of legal norms, law enforcement and judicial practice. Analysis of the provisions of the current legislation makes it possible to identify the significance of a legal norm and determine the degree of its influence on the development of social relations, the participants of which are small forms of farming in the countryside. The solution to the problems of organizing and running small forms of farming in the countryside is the development of agricultural cooperation in the countryside. The organizational and legal form laid the foundation for the effectiveness of entrepreneurial activity in the countryside. In the conditions of non-profitability of agricultural entrepreneurship, the Russian legislator needs to create a stable and comfortable legal environment for the development of rural cooperation. It is necessary to provide in the legislation, it is necessary to provide that measures of state support apply to

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agricultural consumer cooperatives and to personal subsidiary farms of citizens, as the main cell in the structure of agricultural cooperatives.

Keywords Small forms of farming · Peasant farming · Business societies · Agricultural cooperatives · Agricultural organization · Legal status

JEL Classification K15 · K22 · K29 · K39

1 Introduction

Legislators, in our opinion, should give rural residents of Russia working in a special socio-economic environment a chance and a practical opportunity to conduct entrepreneurial activities in a natural free form, corresponding to the specific Russian conditions of agricultural production, the creation and management of small forms of farming in the countryside. "Small forms of business" include peasant farms created in accordance with the Federal Law "On Peasant (Farm) Economy".

2 Materials and Method

The problems of the legal status of small forms of management are studied in the works of Ustyukova (2002), Melnikov (2012), Ryanov (2006), Khannanov (2000), Makarova (2005), Muimba-Kankolongo (2018), Buckett (2013), Barlett (1984), Castrignano et al. (2020), Chandran and Thomas (2018), Edward Taylor and Charlton (2018), Nakajima (1986).

3 Results

Theoretical and organizational problems of the legal status of small forms of farming in rural areas are revealed in the activities of the peasant (farm) economy and other forms of management, the legal regime of their property, property liability, etc. the bearer of the rights and obligations of the economy, the bearer of the legal properties of this subject. We believe that the organizational and legal form has laid the foundation for the effectiveness of entrepreneurial activity. Modern Russian scientists are constantly looking for ways to further develop the institution of legal regulation of agro-business activities of small forms of farming in the countryside.

A large number of scientific works have been written, including doctoral and master's theses in various scientific specialties, devoted to small forms of management. So, Melnikov N.N. proposes to consider as a single integral legal system a set of land, civil, and labor legislation that regulates relations in the field of education,

the creation and maintenance of a peasant farm (Melnikov 2012). According to the scientist, the general provisions on the peasant (farm) economy, enshrined in the codified normative acts, should have their development in the Law "On the peasant (farm) economy". N.N. Melnikov analyzes the evolution of family and labor associations of citizens based on the norms of Roman law and the law of foreign states in the Middle Ages and modern times. According to N.N. Melnikov, the main problem of determining the status of a peasant (farming) economy in Russia is the problem of legal consolidation of the place of a peasant economy among the subjects of Russian law in the norms of Russian law. The scientist notes that at the beginning of the agrarian and land reform, the legislator sought to endow the formed farms with all the attributes of the subject of law, which at the legislative level led to the status of a legal entity of a peasant (farm) farm (Muimba-Kankolongo 2018). However, the property of the farm belonged to the members of the farm on the basis of the right of common share ownership, and not to a legal entity, which contradicted the civil law doctrine of the legal personality of legal entities. N.N. Melnikov, on the basis of an analysis of foreign legislation, identifies four typological forms of peasant (farming) economy in Russia and the CIS, the Baltic States, Eastern and Western Europe, the USA and Great Britain: (1) a family-labor association of citizens, operating without forming a legal entity; (2) a farm is a legal entity; (3) the family farm of the farmer; (4) a farmer is an individual entrepreneur.

Scientists note that in a global perspective, organic agriculture will have an impact on the development of the concepts of organic farming in sustainability, its impact on the ecosystem, management of soil, water resources, livestock, waste (Chandran and Thomas 2018). The commitment of governments around the world to adopt policies that increase agricultural productivity by encouraging farmers to use environmentally friendly growing technologies. Traditional farming practices often have negative impacts on the environment and ecosystem, leading to disease and pest outbreaks (Edward Taylor and Charlton 2018). Outbreaks of numerous diseases and pests, weeds and other invasive plants are putting thousands of people at risk of poverty and hunger, as well as malnutrition (Nakajima 1986). Recommended innovative strategies to improve the agricultural sector, including: management practices that reduce net carbon emissions; technologies that improve soil structure and preserve the natural resource base.

Small forms of farming in the countryside are the basis for ensuring the food security of the Russian Federation. The problems of small-scale farming in rural areas can be solved by popularizing agriculture. Informatization and computerization are essential tools in agriculture, in the work of small forms of farming in the countryside. Informatization and computerization of small forms of business allow solving the problem of low level of computer literacy. Many personal subsidiary plots still have only a landline telephone from the means of modern communication.

We consider it necessary to provide all small businesses with access to the Internet and modern telecommunication means of communication, in order to resolve a number of issues related to access to state and municipal services, payment of taxes, fines, search for suitable agricultural equipment, purchase of feed at an affordable price, compilation of business plan for small businesses in rural areas. If you

have access to automated information systems and portals, an agricultural producer can solve almost any problem of an organizational, economic and legal nature, for example: getting advice at the nearest information and consulting center or a bank loan, choosing an organizational and legal form related to small forms of business, for specific agricultural activities, allotment of land for agricultural activities, application of state support measures, construction consultations.

Grant support for small forms of farming in rural areas implies an increase in purchases of agricultural livestock, the creation of new jobs in the countryside. Support for small and medium-sized businesses in rural areas, the development of livestock and agriculture in rural areas remains a priority of regional and municipal policy. The effectiveness of measures to support family and start-up farms in a harsh economic reality depends on the availability of resources at the disposal of a small business entity in the countryside. Contacting information and consulting centers for small businesses is necessary to reorient agricultural activities, taking into account the current economic conditions, supply and demand for a specific type of agricultural products (Buckett 2013). Thanks to the information and consulting activities of the information and consulting centers, small forms of farming in the countryside choose a break-even path of their development. Small forms of farming in the countryside can be presented in the form of a family business, as the most stable form of farming in the countryside. There are agricultural business models that are not oriented towards government support. Today, small business entities are faced with the issue of choosing an organizational and legal form, carrying out agricultural activities as a personal subsidiary farm, as an individual entrepreneur or registering a peasant farm. In our opinion, beginners in agricultural activity should choose a personal subsidiary farm. On the other hand, the state is interested in increasing the number of peasant farms as the most promising organizational and legal form of farming, which can be developed and to which measures of state support can be applied.

When solving the problems of peasant farms, foreign researchers suggest: stratification and decision making when using new agricultural technologies; use of key technologies (KET) related to agronomic management, remote and proximal sensing, data mining, decision making and automation. Most of the world's agricultural production is controlled by private farms (or family farms).

V.V. Ustyukova rightly draws attention to the Russian problem of blurring the lines between peasant (farm) households and personal subsidiary plots (Ustyukova 2002). In practice, there was a problem of concluding an agreement between citizens on the establishment of a peasant farm in accordance with the provisions of the Law on Peasant Farms. As conducting livestock breeding, are allowed only for legal entities. In the case of the creation of family-type peasant farms on the basis of several (three) families, when the head of the peasant farm is registered as an individual entrepreneur, this transformation of Soviet collective farms with an average of more than 50, and in some cases more than 300 people, is simply impossible to carry out. According to the norms of the above law of December 30, 2012 No. 302-FL, citizens can choose the form of running a peasant (farm) economy at will, registering it without forming a legal entity or organizing a legal entity. Therefore, there is a

dispositive norm, which makes it possible for citizens engaged in entrepreneurial activities in agriculture to choose either the legal status of a peasant (farm) economy without forming a legal entity, or to form a legal entity—a peasant (farm) farm. These changes can be considered significant progress in the legal regulation of agricultural entrepreneurship.

According to Russian law, the legal status of a peasant farm is characterized by the problem of the dualism of its status, which is expressed in the individualization of the rights of the head of a peasant farm, who is an individual, an individual entrepreneur, on the one hand, as well as the presence of signs of a legal entity in the economic activity of a peasant farm, expressed in in the consolidation of the property of individuals who carry out economic activities in a peasant farm on the other hand. In our opinion, the natural desire of citizens to engage in entrepreneurial activity, the norms of Russian civil legislation should not be limited by limiting their forms of entrepreneurship, providing a narrow framework for organizational and legal forms permitted in the Civil Code of the Russian Federation.

F.M. Ryanov noted that the formation of legal entities through strict instructions from the state authorities, violent transformations in relation to a person closely connected with the land and nature, as well as the creation of unnatural forms of state and collective farms, are failing, in contradiction with the natural right of rural workers to carry out free labor activities on earth, the purpose of which is to obtain agricultural products, which are, in fact, natural gifts of nature (Ryanov 2006). Freedom of agricultural entrepreneurship can be exercised by choosing the organizational and legal form of entrepreneurial activity. According to the scientist, the Civil Code of the Russian Federation should not become a barrier to improving civil and agrarian legislation. Otherwise, according to R.A. Hannanov, would be contrary to the demands of economic progress. Separate statutory laws and directly in the constituent documents of agricultural organizations (Hannanov and Hannanova 1997). Almost all adopted special laws that specify the legal status of business partnerships and societies, production cooperatives, state and municipal unitary enterprises have such shortcomings that not only do not ensure the sustainable development of agricultural business entities, but also hinder their development. We believe that the organizational and legal forms available in Russia without significant changes and improvements, as legal models, are not applicable in the modern conditions of agricultural entrepreneurship.

Let us try to analyze from a legal point of view the imperfections of small forms of farming in the countryside. The amendments to the legal status of legal entities adopted in Federal Law No. 99-FZ of May 5, 2014, practically did not solve the problem of the legal status of agricultural commercial organizations. The existing problems of the legal status in the future give rise to the imperfection of the newly adopted legislation regulating the legal status of subjects of agricultural business in the countryside, as well as the ineffectiveness of the norms of civil legislation on the status of economic entities.

The existing legal structures of such entities as a joint-stock company and a limited liability company are mostly focused not on the interests of employees of agricultural enterprises and the stimulation of agricultural labor, but on the interests of capital

investors in the property of an enterprise, investors, and other persons who may be far from the specifics of their activities agricultural organization, and existing social problems in the countryside (Castrignanò et al. 2020). We are convinced that no investors will solve social problems in rural areas to the detriment of their interests. The form of a public joint-stock company, which provides for the free sale of shares to non-rural residents, persons, by their occupation far from agriculture, will also be not in demand by the rural population.

The Law of the Russian Federation of May 5, 2014 No. 99-FZ adopted significant changes to the provisions on the legal status of legal entities. These amendments entered into force on September 1, 2014. We believe that these changes will significantly affect the fate of agricultural commercial organizations created earlier. According to the adopted amendments, the number of limited partners in a limited partnership should not exceed twenty participants. But this form of management does not correspond to the specifics of social relations in the countryside and the specifics of agricultural production. Neither projects of such normative acts are visible, nor their discussion on the pages of scientific publications. We believe that if legislators create a convenient natural organizational and legal form that gives maximum freedom in the field of agricultural entrepreneurship to citizens conducting small forms of farming in the countryside, the number of agricultural businesses and the volume of agricultural production will increase dramatically in the country.

According to economists and civil scientists, joint stock companies are the most optimal form of entrepreneurial activity in Russia. So, according to O.A. Makarova, a joint-stock company is the highest form of an entrepreneurial association, in which not individuals are united, but property (capital) (Makarova 2005). According to the scientist, this form of connection is the highest degree of manifestation of the capitalist essence of man. Each shareholder, who contributed his personal property when purchasing shares, realizes, first of all, a personal interest, prompted by personal gain and the desire for wealth, the acquisition of control over the joint-stock company. The thoughts of the "knights" of private law are understandable and respected, since their ideas and values are "sharpened" on the natural human right—the right to strive for personal gain, personal enrichment, and personal success. It was for the sake of such ideas that large Soviet collective and state farms were fragmented and reorganized. But lately, in our opinion, the "personal ego" has become a serious obstacle in the realization of the natural and constitutional rights of other citizens, in ensuring and protecting public interests, solving social problems, ensuring food and biological security of the state. Scientists economists, analyzing the economic indicators of the dynamics of the number and profitability of agricultural organizations in Russia of various legal models, assess the impact of the choice of certain organizational and legal forms by agricultural producers on the further efficiency of these agricultural organizations. The resulting legal entities as a result of the reorganization of collective and state farms acquired an organizational and legal form in accordance with the Law "On Enterprises and Entrepreneurial Activity". But after the introduction in 1995 of the first part of the Civil Code of the Russian Federation, most agricultural commercial organizations were forced to reorganize again through transformation, since the

Civil Code of the Russian Federation did not provide for the existence of commercial organizations proclaimed by the above law on enterprises and entrepreneurial activity.

At the moment, personal subsidiary farms, which are also not subjects of entrepreneurial activity under civil law, are dominant, however, according to the law, they are not related to small forms of business in the countryside. It is also worth noting that the activities of small businesses are not always recognized as entrepreneurial. Civil legislation is the main legal basis for the development of entrepreneurship in each individual state. The provisions of civil legislation on legal entities and organizational and legal forms of entrepreneurial activity are in fact the foundation of national economies. We believe that in Russia the ability of the rural population to accept and use the organizational and legal forms of entrepreneurship proposed by civil legislation will be of no small importance. We believe that the organizational and legal forms of entrepreneurial activity in each individual country should be adequate to the climatic, social, economic conditions for the implementation of these activities. A cooperative is a subject of economic law, which differs from commercial organizations and companies, first of all, by the principle of non-profit business activity (Barlett 1984).

4 Conclusion

In the conditions of non-profitability of agricultural entrepreneurship, the Russian legislator needs to create a stable, comfortable legal environment for the development of rural cooperation. The legal norms of legislation on the development of small and medium-sized businesses in the Russian Federation regulate a special, different from the general, established by the civil legislation of Russia, legal procedure for determining small and medium-sized businesses, introduce classifications of non-profit organizations, enshrined in civil law as subjects of economic activity. In legal science, legal scholars have different approaches to assessing the provisions of the civil legislation of the Russian Federation, according to which commercial legal entities can be created exclusively in those organizational and legal forms that are provided for by the legal norms of the Civil Code of the Russian Federation. We believe that the listed list of organizational and legal forms provided for by the Civil Code of the Russian Federation should be considered not as exhaustive and, as a consequence, limiting the freedom of agricultural entrepreneurship, but as the most acceptable in a market economy. In our opinion, the scientific legal community needs to conduct scientific research to improve the existing organizational and legal forms and identify new, more progressive and effective organizational and legal forms of small forms of farming in rural areas that have legal, economic and social advantages and have the potential to ensure the sustainability of agricultural entrepreneurship.

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Current Trends in Customs Enforcement of Measures to Protect Intellectual Property Rights Within EurAsEC

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Abstract The purpose of this article is to consider modern technologies for the protection of rights to intellectual property objects (hereinafter—OIP) in the context of the development of integrated information digital systems in the unified customs territory of EurAsEC by analyzing: the legal component, international activities and projects. At the present stage of economic development, intellectual property occupies a special place from all types of property. The spread of counterfeit and falsified products, especially in the field of the production of medicines and food products, has reached a peak of development. Only in the territory of the EAEU, the amount of counterfeit goods reaches 30% percent, which entails not only financial losses of producers, but also leads to other grave consequences, namely, harm to health and life of people. The main legal acts regulating the procedure and methods of protection of rights to OIP are considered and analyzed. Emphasis is placed on the need to introduce a single customs register of intellectual property of the member states of the Union as a tool for optimizing copyright protection mechanisms. In the course of the research, gaps were identified in the activities of the Eurasian Economic Commission to create a single information space throughout the customs territory of the Union member states and ways to solve them were proposed. An analysis of statistical data characterizing the activities of the Federal Customs Service of the Russian Federation regarding the protection of OIP in recent years has been carried out.

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JEL Classification F52 · K11 · K33

1 Introduction

The development of export cooperation is formed in the modern market environment under the influence of many factors that can create its competitive advantages in the current, medium and long term (Bolshenko et al. 2021).

From the moment when the Eurasian Economic Union was established, the member States of the Union are constantly working on the development and updating of uniform legal acts on customs regulation, as well as on their uniform application (www.eurasiancommission.org) This cannot be realized without creating a single information space within the entire customs territory.

Earlier, the authors noted (Arsentyeva et al. 2021) that mutually beneficial and equal cooperation with third countries is possible only through intensified cooperation with regional integration associations and international organizations, participation in the implementation of global global initiatives, is a key area of activity of the EAEU.

In the system of customs regulation of the member states of the Union, the most relevant is the issue of protecting the rights of copyright holders from the illegal use of their intellectual property, the creation and practical application of understandable and transparent rules for the movement of such objects across the customs border of the Union. At the time of the creation of the legal framework of the EAEU activities, the existence of threats related to the free movement of goods through a single customs territory was taken into account. An analysis of the forms and methods of protection of OIP rights not only in the territory of the Russian Federation, but also in all EurAsEC member countries remains relevant at present. Customs administration for the protection of OIP rights requires the development of completely new approaches based on the application of integrated digital information systems and technologies. The digitalization process of Customs will help to speed up and simplify Customs procedures and increase their efficiency.

2 Materials and Method

All data used in the article were obtained from publicly available sources: official websites of international organizations and state executive bodies, statistical collections, bulletins, articles, etc. (https://customs.gov.ru/).

3 Results

Within the framework of the Eurasian Economic Union, the mechanism for protecting the rights to OIP consists of various elements, the main of which is the element of legal regulation of the movement of these objects across the customs border.

Before disclosing the legal basis for the movement of OIP across the customs border of the Union, it is necessary to determine what intellectual property is, how it is protected by the state and what serious consequences a violation of the rights of copyright holders can lead to participants in foreign economic activity.

The EAEU Treaty (www.consultant.ru) in the Protocol on Protection and Protection of OIP Rights gives a clear definition of OIP, which means not only works of science, literature and art, but also trademarks and service marks, names of origin of goods, etc. OIP can also include those objects that are protected under international law.

In addition, the Protocol establishes measures for the protection and protection of OIP in relation to the characteristics of certain types of facilities. To implement the provisions of the EAEU Treaty, the member states of the Union constantly interact, this makes it possible not only to harmonize the legislation, but also to create the most acceptable conditions for FEA participants moving goods containing OIC through the customs border. At the same time, the consumer of such goods remains, first of all.

When developing legislation in the field of intellectual property in the Eurasian Economic Union, a number of international treaties were adopted as a basis (Fig. 1).

The EAEU Customs Code is as close as possible to international legislation regarding the application of measures to protect OIP when goods are transported across the customs border of the Union. First of all, this applies to the Paris Convention of 1883, which establishes general rules for the protection of the trademark in the member countries of the Paris Union.

The convention defines that the objects of industrial property are patents for inventions, utility models, industrial designs, trademarks, service marks, company names and indications of origin or place of origin, as well as measures to protect copyright from unauthorized use by unscrupulous entrepreneurs of foreign OIP. The Paris Convention (and now the EAEU Treaty) establishes a rule for the protection of facilities throughout the territory of the member countries of the Paris Union.

By analogy with the Madrid Agreement of 1891, the Decision of the Board of the Eurasian Economic Commission of 06.03.18 No. 35 sets out in detail the procedure and conditions for inclusion in the unified register of OIC of the member states of the Union, the procedure and term for protecting the right to such facilities.

The procedure for interaction between the Eurasian Economic Commission and customs authorities of the member states of the Union in implementing the provisions of this Decision is defined in the Regulation on the maintenance of the unified customs register of OIP of the member states of the EAEU (www.consultant.ru). However, while the legal aspects of OIP protection in the Madrid Agreement relate to trademarks, the Union's customs law in the field of intellectual property also

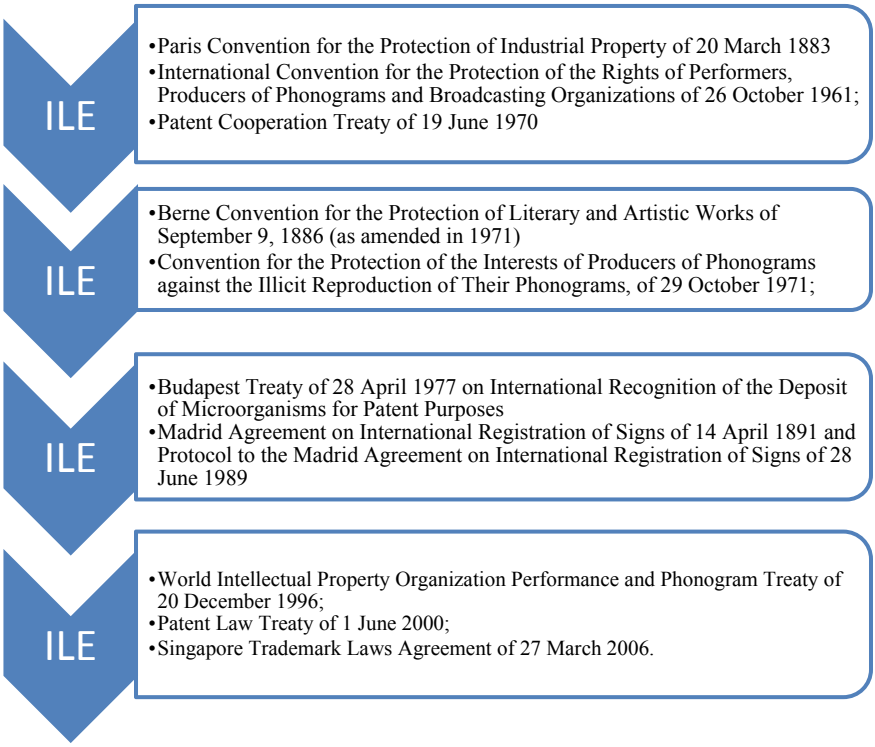

Fig. 1 International intellectual property law. *Source* Own development

covers other types of objects. But the provisions of the Madrid Agreement are still taken as the basis. When registering an OIP, the same information about the product, its manufacturer, the deadline for submitting and considering applications, the period during which the right of the object of intellectual property will be protected are taken into account. These rules are reflected in Chapter 52 of the EAEU Code (www.consultant.ru), which establishes measures to protect the rights to OIP. At the same time, the actions of customs officials can be systematized into two fundamental areas: registration and control (Fig. 2).

The registration direction is administrative and procedural in nature and includes the following regulatory mechanism:

- an application is submitted to the customs authorities by interested persons with the necessary documents attached (as a rule, this application is submitted in electronic form);
- the responsible department of customs authorities shall, within 3 working days from the date of the decision, ensure the inclusion of goods containing OIC in the single customs register, and also ensure the publication on the official website of the Union of all necessary information;

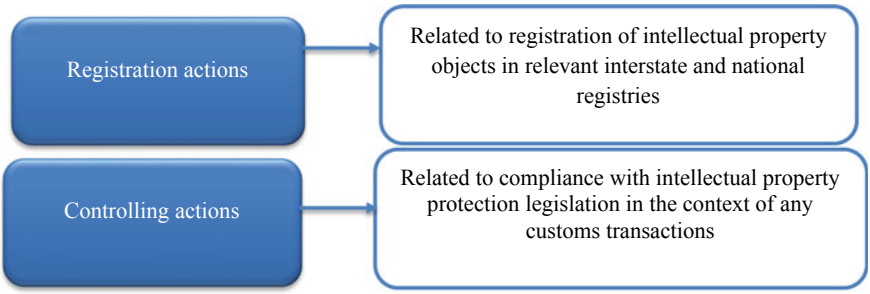

Fig. 2 Main activities of customs officials. *Source* Own Development

- this object is assigned a registration number containing information about the record number, object type, Decision number and the date of inclusion in the register. The term of inclusion in the register may not exceed two years.

4 Conclusion

As for the second direction, the possibility of applying certain measures aimed at protecting OIP rights is provided for in Art. 124 of the EAEU TC, and also implemented at the national level in Art. 113 of the Federal Law "On Customs Regulation in the Russian Federation" (www.consultant.ru). Both the interstate and national level of protection provide for the possibility of applying such measures as the suspension (and subsequently the resumption) of the release period of goods that contain OIP, but the latter are not included in the Unified Register of OIP-EROIS (at the EAEU level) or in the customs register-TROIS (at the level of a separate sovereign).

At the same time, the declarant, when moving the relevant goods, the information about which is included in EROIS and TROIS, performs certain actions related to the placement of these goods under the corresponding customs procedure.

Customs authorities, for their part, carry out operations to verify the information stated in the declaration of goods and aimed at the release of goods. At the same time, customs officials apply measures to ensure the conduct of customs control.

In addition, the customs authorities of the EAEU member states may suspend the procedure for issuing goods that are not included in the specified register. The specified procedure can be suspended under the following conditions:

- a violation of the rights of the person - the right holder was found (at the same time, the objects of law themselves should be subject to the legal regime of protection in the territory of the member countries of the Union);
- there is information about the holder of the relevant rights on the territory of the member countries of the Union.

Therefore, the customs authorities of the Russian Federation for 2020 in the course of ensuring compliance with legislation in the field of protection of OIC

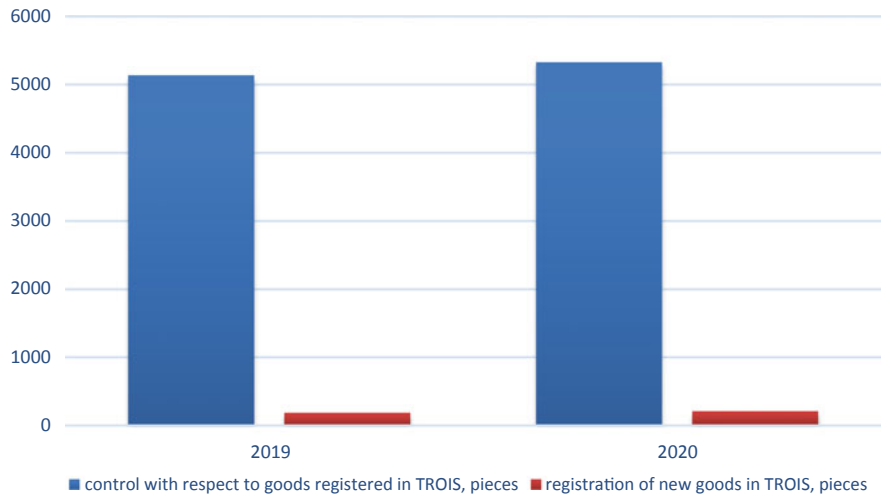

Fig. 3 Activities of customs authorities to protect the rights to OIP in 2019–2020. *Source* Own development based on statistical materials

rights identified more than 10.6 million units of counterfeit products, which is 4% less than in 2019. In the course of their activities, they prevented damage that could have been caused to the owner of the OIC by 8.5 billion rubles. in 2020, which is more by 500 million from the prevented damage in 2019.

Moreover, the customs authorities continued their activities to protect goods classified as intellectual property (Fig. 3):

In order to successfully implement the provisions of the international legislation of the Eurasian Economic Union and the national legislation of the member states of the Union, it is necessary not only to constantly improve the activities for the protection of OIP rights in the legal aspect, but also to look for new approaches to the interaction of customs authorities of all member states. This is reflected in the Strategy for the Development of the Customs Service of the Russian Federation until 2030 (www.consultant.ru). Automation of customs operations and customs control on the basis of reducing time costs becomes possible only in a single information space, and not only with the state supervisory authorities of the Russian Federation, but also within the entire Eurasian Economic Union.

This requires state-of-the-art OIP protection technologies based on integrated digital systems. First of all, it is necessary to develop and implement an algorithm for automatic registration of OIP in TROIS; provide for the possibility of immediate communication with rights holders when declaring and issuing goods included in TROIS, especially when identifying signs of counterfeit goods. The registration of declarations and the issuance of goods is already automatic in many cases, which means that it is necessary to improve the mechanism for automating the registration and issuance of those declarations that contain OIP that are protected. It is necessary

to ensure the possibility of electronic interaction of customs authorities of the Union member states in the performance of functions for the protection of OIP rights.

The FCS of the Russian Federation provided for 2021 a number of public events for the practical implementation of the tasks set. This, first of all:

- seminar for rights holders within the framework of the meeting of the working group of the Federal Customs Service of Russia and the Main Customs Administration of the People's Republic of China (as the main trading partner of the Russian Federation) on intellectual property protection;
- webinar "Topical issues of customs protection of OIP rights";
- round tables, working meetings, training seminars, meetings of advisory councils and interdepartmental working groups on all regional customs administrations of Russia.

The Eurasian Economic Commission is also working to improve the protection of OIP rights. Therefore, for example, the online chicken "EAEU: what is it and how does it work?" In the open electronic education system "Universarium." The online course includes a review of the fundamentals of the OIC unified customs registry.

However, the most important thing has not been done - not a single object of intellectual property is included in the single customs register. The regulation on maintaining a single customs register was adopted back in 2018, it was decided to develop and approve technological documents on information interaction. The Regulation allows rights holders to use their rights to OIP throughout the customs territory of the Union, to receive protection of their rights, regardless of its belonging to the member state. And, which is by no means unimportant, will lead to a decrease in the costs of the copyright holder in cases of identification of risks of violation of his rights.

The institutional development of the register objectification of intellectual property of the EAEU member states will increase the quality and effectiveness of the customs authorities in terms of functional protection of OIP rights.

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The Mechanism for Ensuring Economic Security in the State's Foreign Trade Policy

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Abstract For many countries around the world, including Russia, economic security is one of the main tasks of the country's leadership and the government. It is an indicator that allows monitoring the country's situation and, according to this situation, predicts the economic development and security in various areas of small and medium-sized businesses and major budget segments. The analysis has shown that several specific functions must be performed in Russia during the crisis, including timely and prompt identification and prediction of threats to Russia's economic security. Such threats include negative trends and processes of economic, political, social, technogenic, energy, and environmental nature, as well as targeted actions from outside and inside the society that pose a threat to the country's interests. The authors recommend measures to improve Russia's economic security by eliminating internal and external factors that can negatively impact the country's economy.

Keywords Politics · Mechanisms · Elements · Concept · Monitoring · Factors · Economic security · Crisis · Strategy · Threat · Instrument

JEL Classification F52 · F13 · F41 · H56

1 Introduction

Ensuring the economic security of the country is a complex modern mechanism. In order to broaden the topic, it is advisable to understand the terminology. "Mechanism" is a set of interrelated elements controlling an object. This concept can be viewed from monitoring and forecasting perspectives.

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Russia is undergoing a stage of transition to new methods of economic activity and the conduct of the economy. The reforms affect almost all spheres of life, be it science, production, education, or economy. Therefore, it is essential to focus on considering the sphere of foreign economic activity.

In Russia, foreign economic activity saw a dramatic change, since, back in the Soviet Union, exports and imports were exclusively a state monopoly. Nevertheless, there has been a liberalization of trade since the formation of the Russian Federation.

2 Materials and Methods

The fundamental and methodological basis of this study was formed by the works of (Moscow International Trade Center 2021; Tsvir and Titova 2019; Veselovsky et al. 2015, 2016). The chronicle of Russian economic life in the 1990s leads to the conclusion that the transition to sustainable development is crucial for the country. The problems of the recovery of the Russian economy must be solved through the transition to a new modern technical and technological base. Only in this case will there occur a real GDP growth. The renewal of fixed assets, especially in the resource-efficient sectors of the economy, will ensure high rates of economic growth in the high-tech and manufacturing industries.

This stabilizes the financial and monetary system by making the economy minimize inflation and budget deficits. Enhancing the economic potential will strengthen the economic security of the country. A strong economic potential will ensure the formation of a full-fledged budget, which will allow the government to carry out its social mission and become the basis for the progressive development of society. A full-fledged budget would ensure the economic well-being of society and its members and strengthen the defense capabilities of Russia.

The presence and development of social inequality also pose a serious threat to Russia's economic security.

The trend of spatial heterogeneity of the economy in the Russian Federation tends to intensify. Annual economic losses caused by the inefficient use of finance amount to about 3% of GDP.

Unfortunately, the federal law "On the Fundamentals of National Oversight of Regional Development of the Russian Federation," submitted to the State Duma of the Russian Federation in 2020, has not yet demonstrated a continuous overcoming of economic differences between the Russian subjects. Moreover, we can conclude that the economic security of the Russian region also significantly differs in the areas of industrial and innovative development.

In the post-Soviet era, the opening of international trade occurred in the absence of an effective infrastructure to protect owners' rights.

3 Results

The strategic vision of economic security aims to meet the challenges and threats to economic stability and prevent them. This has led to a contraction of the main sectors of the economy, the growth of corruption, and an increase in economic crime (Government of the Russian Federation 2008).

In formulating a strategy for the economic and social security of the country and its region, it is necessary to form a more advanced and multifactor approach.

The following measures should be implemented to solve these problems:

- It is necessary to actively develop scientific and practical cooperation between institutes of the Russian Academy of Sciences;
- People engaged in research on economic and social protection should use their experience in organizing and coordinating research and conducting scientific discussions;
- It is necessary to provide an ongoing dialogue between the authorities and the public administration and between academia and the university community to ensure timely response;
- It is necessary to continue holding the annual conference in the Institute of Economics of the Russian Academy of Sciences, V.A. Trapeznikov Institute of Management Problems of the Russian Academy of Sciences, and other scientific institutions of the Russian Academy of Sciences.

Thus, there are two systems of action for all authorities to improve the economic security of the country.

The first system is a continuous control by all authorities to respond to minor threats to economic security contained in the strategy or formulated in general terms to improve the situation.

The second system lies in overcoming the differences of various agencies and organizations that face real threats to economic security. Its concept is multifaceted. The strategy and goal of this system are to maintain the domestic economic order of the country, thereby ensuring the development of foreign economic relations. Given Russia's national interests, this also applies to trade relations between countries, the expansion of the number and scale of exports of primary raw materials, as well as investment and foreign economic relations.

During the period of sanctions, the issue of increasing the efficiency of foreign trade is especially important for Russia.

Many authors propose to classify threats to economic security on various grounds, namely:

- Type of damage;
- Scale of action;
- Source of occurrence and formation;
- Type of object;
- Degree of openness of the institution;
- Causes of occurrence and forecasting capabilities, etc.

The differences between countries are deepened in the current context of developing the world system of economic and political relations (Sorokin 2018). This leads to an increase in the degree of economic confrontation. One of the forms of the occurring confirmations is economic sanctions.

One of the vectors of strengthening the economic foundations of state security is economic cooperation with foreign countries. Investments in the economy of other countries and investments in the economy of Russia are one of the forms of economic cooperation with foreign countries. In general, this ensures the security of the countries of the global community, develops economic ties, and supports institutional, technological, and social progress.

Military-economic cooperation with foreign countries, especially sales of arms, has a special place in the system of state budgeting and the development of the military-industrial complex, which generally ensures the national security of the country (Fig. 1). Funds received from the sale of weapons can be used to develop the technological and material base of military production, as well as to develop and adopt new weapons systems.

Consequently, we can distinguish two types of mechanisms to ensure the economic security of the state—intra-economic and foreign economic. The main directions of developing the intra-economic mechanism are as follows:

	Exporter	Share of arms exports (%)		Per cent change from 2010–14 to 2015–19[a]	Main clients (share of exporter's total exports, %), 2015–19		
		2015–19	2010–14		1st	2nd	3rd
1	United States	36	31	23	Saudi Arabia (25)	Australia (9.1)	UAE (6.4)
2	Russia	21	27	−18	India (25)	China (16)	Algeria (14)
3	France	7.9	4.8	72	Egypt (26)	Qatar (14)	India (14)
4	Germany	5.8	5.3	17	South Korea (18)	Greece (10)	Algeria (8.1)
5	China	5.5	5.5	6.3	Pakistan (35)	Bangladesh (20)	Algeria (9.9)
6	United Kingdom	3.7	4.6	−15	Saudi Arabia (41)	Oman (14)	USA (9.1)
7	Spain	3.1	2.9	13	Australia (33)	Singapore (13)	Turkey (11)
8	Israel	3.0	1.8	77	India (45)	Azerbaijan (17)	Viet Nam (8.5)
9	Italy	2.1	2.7	−17	Turkey (20)	Pakistan (7.5)	Saudi Arabia (7.2)
10	South Korea	2.1	0.9	143	UK (17)	Iraq (14)	Indonesia (13)
11	Netherlands	1.9	2.0	−2.8	Indonesia (17)	USA (14)	Jordan (13)
12	Ukraine	1.0	2.8	−63	China (31)	Russia (20)	Thailand (17)
13	Switzerland	0.9	0.9	2.6	Australia (18)	China (14)	Saudi Arabia (14)
14	Turkey	0.8	0.5	86	Turkmenistan (25)	Oman (12)	Pakistan (12)
15	Sweden	0.6	1.8	−65	USA (22)	Algeria (12)	UAE (10)
16	Canada	0.6	0.9	−33	Saudi Arabia (34)	India (11)	UAE (10)
17	Norway	0.4	0.6	−30	Oman (35)	USA (20)	Finland (14)
18	UAE	0.4	0.2	86	Egypt (41)	Algeria (13)	Unidentified state (12)
19	Australia	0.3	0.3	11	USA (42)	Indonesia (18)	Canada (18)
20	Belarus	0.3	0.5	−23	Viet Nam (31)	Sudan (16)	Serbia (15)
21	Czechia	0.3	0.1	453	Iraq (39)	USA (17)	Ukraine (9.0)
22	South Africa	0.3	0.5	−36	USA (23)	UAE (20)	Malaysia (11)
23	India	0.2	0.0	426	Myanmar (46)	Sri Lanka (25)	Mauritius (14)
24	Brazil	0.2	0.2	6.8	Afghanistan (38)	Indonesia (17)	Lebanon (11)
25	Portugal	0.2	0.0	1 239	Romania (95)	Uruguay (2.9)	Cabo Verde (1.2)

Fig. 1 Major exporters and their customers of arms sales in 2014–2019 dynamics. *Source* Wezeman et al. (2019)

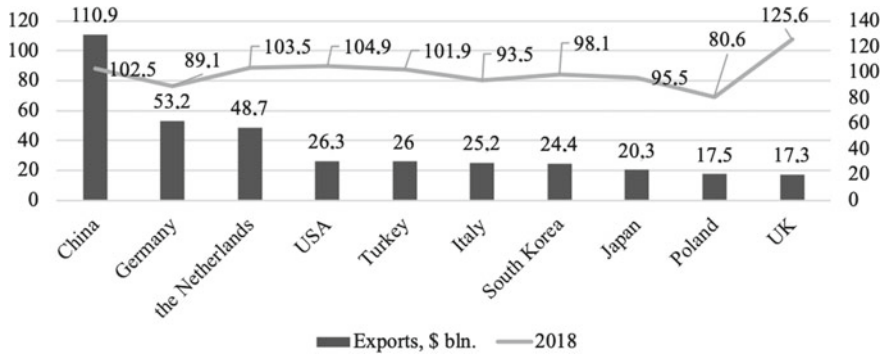

Fig. 2 Russia's leading trade partners in 2019. *Source* Compiled by the authors based on Foreign Trade of the Russian Federation (2021)

- Accumulation of strategic reserves;
- Rational use of natural resources and labor potential of the country;
- Geographical location and climatic conditions of all 85 subjects of Russia.

The development of the foreign economic mechanism involves the following:

- Expansion of military-economic cooperation;
- Development of economic associations with foreign countries in the alliances already created or being designed;
- Increasing the competitiveness of domestic products (Fig. 2).

Nevertheless, due to the recent events associated with the collapse of the OPEC agreement, the sharp fall in the ruble, and the COVID-19 pandemic, Russia's foreign economic activity is disrupted. Thus, the ruble fell by 19.7% within a month (the ruble-dollar exchange rate was 82.3 rubles as of March 23, 2020).

These adverse events affected not only Russia but the world as a whole. For example, Germany's GDP saw a 5.7% fall in a month; the shares of the world's largest cruise operator decreased from $60 to $12 (Sangalova 2020).

The price of one barrel of oil on February 25, 2020 was $ 55, and on March 23, the price was $25 (Profinance n.d.). Moreover, it is forecasted to fall further, which will also affect the foreign economic activity of world leaders, including Russia.

Predicted possible damage to the economy equals about $3 trillion, which is equivalent to the GDP of the UK (Mylnikov 2020). Nevertheless, the People's Republic of China is taking control of the outbreak. Accordingly, the world leader's economy should stabilize by Q3 2020. However, everything depends on how the pandemic will affect the rest of the world (the US, Brazil, India, UK, Canada, South Korea, Japan), since a slowdown in the economies of all the world leaders will cause stagnation at the global level.

The main objectives of the foreign trade policy of each country are as follows:

- Maintaining military supremacy;
- Preventing the adverse effects of foreign competition;

- Maintaining the country's balance of payments by regulating imports of goods and meeting the needs of the domestic market in situations of critical lack of agriculture or other goods by regulating exports of these goods.

Russia has all the necessary conditions to achieve the level of a foreign trade corresponding to its potential. Russia is dynamically involved in such tasks as environmental protection, the state of international trade, etc.

It is necessary to cooperate with other countries and create domestic products to ensure the current stability and provide a future increase in the Russian economy. In foreign trade, increased attention should be paid to the formation of suitable conditions for attracting foreign investments. In exports, priority should be given to supporting science-intensive and high-tech exports. Russia needs to fight for equality in the world market.

The analysis of the national economic security of Russia showed the following significant threats:

- Decline in the rate of economic development;
- Low indicator of average per capita GDP;
- Raw material orientation of exports;
- Low competitiveness of products;
- Outflow of Russian capital abroad;
- Federal budget deficit;
- High level of wear of equipment;
- Low solvent demand of population;
- Insufficient size of budget provision of the social sphere.

Therefore, the development of economic security strategy should be based on priority long-term goals and national-state interests. It must be oriented to the socio-economic model of regulatory functions. In the conditions of integration into the world economic system, Russia should pursue the following goals:

- Creation of a self-sufficient socially oriented economy;
- Preservation and development of intellectual, scientific, and technical potential;
- Construction of equal and mutually beneficial economic relations with other countries.

The strategy should prevent crisis phenomena in the resource and raw material, industrial, scientific and technological, financial, and innovation spheres. Moreover, it should stimulate innovative and human development. The purpose of creating the strategy is to increase the sustainability of the economy and ensure economic growth. Additionally, it provides for improved responses in the event of sanctions. Furthermore, the strategy considers the need for balanced development of Russian regions and the use of the competitive advantages of export-oriented economic sectors.

4 Conclusion

According to the conducted analysis, several special functions must be carried out in Russia during the crisis, including timely and prompt identification and prediction of threats to Russia's economic security. Such threats include negative trends and processes of economic, political, social, technogenic, energy, and environmental nature, as well as targeted actions from outside and inside the society that pose a threat to the country's interests.

Moreover, it is also relevant to prevent, localize, and neutralize the identified potential and real threats to the country through the necessary legislative, administrative, economic, and informational measures. It is advisable to directly counteract the carriers or source of threats through the implementation of appropriate mechanisms.

Thus, these measures can improve the economic security of Russia by eliminating internal and external factors that can negatively impact the economy of the country.

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Some Features of the Activity of the Chuvashpotrebsoyuz During the Great Patriotic War of 1941–1945

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Abstract In the year of the 75th anniversary of the Victory in the Great Patriotic War, 1941–1945 the study of the history of the feat of the Soviet people acquires special relevance and serves to preserve historical memory. The authors set the goal—to reveal the characteristic features of the activity of the consumer cooperation system in difficult conditions of the military pore. The research used genetic, comparative, systemic methods, as well as an institutional approach. Based on the analysis of archival documents, published sources and literary materials, the article reflects some areas of activity of the Chuvashpotrebsoyuz during the Great Patriotic War. Cooperators of Chuvashia made a possible contribution to strengthening the country's defense capabilities. A significant number of employees of cooperative organizations were drafted into the army, significant material resources (vehicles, buildings, structures, etc.) were allocated to the needs of defense. Cooperators of Chuvashia took an active part in the construction of defensive structures on the Sursky frontier and Kazan bypass in the winter of 1941–1942. Small workshops and workshops of consumer cooperation mastered the production of goods necessary for the army and the population. Cooperative organizations increased their own production and purchases of agricultural products and raw materials. All the activities of consumer societies of the republic were aimed at improving and strengthening the financial economy by fully mobilizing funds, which made it possible not only to provide financing for their

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economic activities, but also to transfer a significant part of the funds to the state. In article concrete examples and statistical data of supply of raw materials, materials, food products, money on strengthening of defense capability of the country and life support of the population are given. This experience is undoubtedly not only of scientific, but also of practical interest, which can be used to ensure the stable functioning of the system of consumer cooperation in Russia in the context of economic transformations.

Keywords Great Patriotic War · Chuvashpotrebsoyuz · Consumer cooperation · Economic activity · Food products · Cash · Fund mobilization · Strengthening defense capabilities · Life support of the population

JEL Classification H56

1 Introduction

This year 2020, our country celebrates the 75th anniversary of the Great Victory. Russian President Vladimir Putin said in a message to the Federal Assembly that May 9th for Russia is the greatest and most holy holiday and our memory is not only a tribute to the historical past, but it also serves the future and consolidates our unity (Putin 2020). Every year, the number of witnesses of the war is getting lower, so preserving the memory of the war becomes an urgent task of the humanities, the media, educational institutions, culture, etc.

Employees of cooperative organizations and institutions of the Chuvash Republic in the anniversary year took an active part in events within the framework of the celebration of the 75th anniversary of the Victory in the Great Patriotic War of 1941–1945.

2 Methodology

Information on this topic has been reflected in a number of publications and on the official websites of consumer cooperation organizations. For example, the website of the Central Union of the Russian Federation and regional consumer unions posted materials on the contribution of employees of the consumer cooperation system to the cause of the Great Victory (Chuvash Consumer Union 2020; https://rus.coop/lp/victory/). This year, the industry newspaper 'Chuvash Consumer Union' in a special section 'On the 75th Anniversary of Victory in the Great Patriotic War' published articles on the military and labor exploits of fathers and grandfathers of current workers of consumer organizations and enterprises (Chuvash Consumer Union 2020). The Cheboksary Cooperative College of the Chuvashpotrebsoyuz and the Cheboksary Cooperative Institute (branch) of the Russian University of

Cooperation hold thematic events, on their official websites various materials are posted about the events of the military era, military and labor exploits of Soviet people (http://cheb.ruc.su/; http://21chkt.ru/). These events are part of the patriotic education of the younger generation, the significance of which is touched upon in the publications of Andreev V.V., Mikhailova E.M. and others, which indicate that the most important means of forming a civil society, strengthening the unity and integrity of the multinational Russian Federation is patriotic education of citizens based on the study of the historical experience of the formation and development of our Fatherland (Andreev et al. 2017; Chernoyarova et al. 2017).

The article is written on the basis of analysis of published sources and literature, primarily archival documents and newspaper publications (Semyonov et al. 1975; Chuvash Consumer Union 2020; Chuvash regional organization of the CPSU 1989; Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000; Grigoriev 2002; 'Red Chuvashia' 1941; 'Red Chuvashia' 1941; 'Red Chuvashia' 1943; 'Red Chuvashia' 1943). The authors aimed to show the most characteristic features of the activity of the consumer cooperation system in difficult military conditions. This experience is undoubtedly not only of scientific but also of practical interest. The study used genetic, comparative, systemic methods, as well as an institutional approach.

3 Results

The Great Patriotic War of 1941–1945 became a difficult test for all the Soviet people. From the first days of the war, all the country's resources were focused on the defeat of the treacherous aggressor. The slogan 'Everything for the front! Everything for Victory!' concerned all citizens, wherever they are—at war or in the rear. The country's consumer cooperation in difficult wartime conditions took on a significant part of the solution to the most important task of supplying the army and the population with food and basic goods. On the eve of the war, members of 32,190 consumer societies consisted of 44 million people, they were served by 229 thousand shops and shops, tens of thousands of canteens, tea shops, bakeries and other enterprises located mainly in rural areas. Like state-owned enterprises, cooperative organizations worked mainly on the directives of party and state bodies. The Central Union functioned under the command of the People's Commissariat of the USSR as the headquarters of the industry in the mode of the People's Commissariat.

The Chuvash Autonomous Soviet Socialist Republic was part of the Moscow Military District. On the basis of the Decree of the Presidium of the Supreme Soviet of the USSR of June 22, 1941 'On the Mobilization of Military Liable,' thousands of residents of the republic were drafted into the army, many filed applications for voluntary entry into the ranks of the Armed Forces. In total, over the years of the war, more than 208 thousand residents of Chuvashia served in the army, of which 106 thousand did not return from the battlefields (History of Chuvashia of the Newest Time 2001, p. 216). Seven rifle, two cavalry divisions, an engineering and sapper

brigade, a brigade of NKVD troops, a railway brigade, units of the 11th car mechanized regiment, the 293rd separate rifle regiment, the 775th assault aviation regiment and the 53rd separate division of armored trains were formed in the republic. In order to replenish the army with trained personnel, two reserve communications regiments, rifle, artillery and aviation spare parts operated on the territory of Chuvashia. In order to treat the wounded and sick fighters and commanders of the Red Army, 17 military rear evacuation hospitals were deployed, in which 57,145 wounded and 15,013 soldiers were treated during the war years. Chuvashia accepted 28 enterprises evacuated from the western regions of the country (History of Chuvashia of the Newest Time 2001, p. 217).

Cooperators of Chuvashia also made a feasible contribution to strengthening the country's defense capabilities. A significant number of employees of cooperative organizations were drafted into the army. Significant material resources of cooperative organizations were allocated to defense needs: vehicles, buildings, structures, etc. For example, on July 4, 1941, a decree was issued by the Presidium of the Central Union of the USSR and the RSFSR on the liquidation of the Cheboksary Cooperative College, according to which its buildings (educational and dormitory) and property were donated to the Military Council of the Moscow Military District. The canteen of the educational institution with kitchen equipment was transferred to the Cheboksary Trust of Canteens and Restaurants by a resolution of the Council of People's Commissars of the Chuvash Autonomous Soviet Socialist Republic of July 25, 1941. Teachers and employees came to the disposal of the Chuvash Union of Consumer Cooperation or were released from work, and students were sent to practical work in the consumer cooperation system (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 96–97).

Workers of cooperative organizations of Chuvashia took an active part in the construction of defensive structures on the Sursky frontier and Kazan bypass in the winter of 1941–1942. About 85 thousand residents of the republic went daily to build anti-tank ditches, bunkers, trenches and earthlings. Among them, workers of consumer organizations and enterprises also worked. In conditions of severe winter, when the temperature fell below 40 degrees, 4897 thousand kbm were taken out manually, 2347 firing points were made, 1970 earthlings, labor productivity amounted to 1.42 kbm per man-day 4 million 897 thousand cubic meters. m of soil (Andreev and Antonova 2010, pp. 193–194; Semyonov et al. 1975, s. 85; Grigoriev 2002, s. 152). Consumer cooperation organizations carried out orders for the supply of food to these strategic facilities.

Small workshops and workshops of consumer cooperation mastered the production of goods necessary for the army and the population. They manufactured various products primarily for the needs of defense: cuttings for infantry and sapper blades, axes, ammunition containers, parts and fittings for carts, skis, snowshoes, sewing camouflage suits, cotton jackets, warm sleeves, tolograkes, etc. Food industry cooperators dried breadcrumbs, vegetables, produced meat and dairy products, organized the production of dry casein for the needs of the aviation industry. With a shortage of flour, bread was baked with the addition of five to six percent of potatoes. Instead of vegetable oil, wood flour was used to supply bread forms. In 1942, by decree of the

party and government, consumer cooperation also organized subsidiary agricultural enterprises for growing vegetables, breeding poultry, and feeding animals.

During the war years, the search for decentralized sources of replenishment of commodity resources became of particular importance. Cooperative organizations increased their own production and purchases of agricultural products and raw materials. So, during June and July 1941, the Chuvashpotrebsoyuz laid 10 wagons (956 boxes) of eggs in refrigerators and lime pools. On October 20 of the same year, 49 thousand pcs of different poultry were procured and delivered to poultry bombers of the republic, with a total weight of 131 tons. The bulk of these products were shipped mainly to Moscow (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 98–99). In 1943, 20 raypishchekombinats worked in the republic, mainly on the basis of local raw materials. More than 450 tons of various vegetable and melon crops and about 600 tons of sugar beet, which is processed into sugar syrup and is the main sugar substitute, were obtained from their raw materials. Various wild food fruits and berries were collected 149 tons (Semyonov et al. 1975, p. 190).

Consumer organizations sent a significant share of food products to the needs of the army. For example, in January 1943, 326.5 tons of crumbs were shipped to the Kanash head military depot, of which 182.6 tons were wagons, from Art. Urmary two cars (one 4-axle), from Ishley—one car, from Vurnar—one car (4-axle), from Ibresi—one car, from Sumerli—one car, from Alatyr—five cars (one 4-axle) and from the station. Tracks—one car (4-axle), a total of 14 cars. In the first decade of February of that year, three wagons were shipped from Cheboksary to military station No. 4. As of February 1, 1943, the remainder of the crumbs is 179 tons, of which 65 tons were located near railway stations (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, p. 99). For the defense industry, the organizations of consumer cooperation of Chuvashia in 1943 procured 68 tons of krushins (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 103–104).

In 1941–1942 28 industrial enterprises arrived in Chuvashia, more than 70 thousand evacuees, including about 27.7 thousand children. The organizations of the Chuvashpotrebsoyuz took care of supplying food to the evacuated population, evacuation hospitals, and children's institutions. On the territory of the Chuvash Autonomous Soviet Socialist Republic there were 15 evacuation hospitals with 4350 beds (Semyonov et al. 1975, p. 225). In order to organize the catering of the arriving evacuation contingent, special canteens were allocated in Yadrin, Sundyr, Vurnary, Urmary, Marposad, Oktyabrsky. In the districts of Chuvashia, 15 evacuated kindergartens were placed, which were provided with products by allocating special funds for food products by the district unions. During the IV quarter of 1941 and the I quarter of 1942, the evacuated population was supplied, according to the instructions of the Chuvashpotrebsoyuz, primarily at the expense of general funds allocated by the district unions. So, in September, 1941 t of cereal was allocated to evacuees, in the III quarter of 31 1941 715 additional flour fund in the amount of 1942 t was released, in January, 42 t of flour and 4.7 t of rice. Enough cereals, fats, meat, confectionery, sugar

and other products were supplied to children's institutions (Mikhailov 2006, pp. 99–100). Most of the evacuees were employed in enterprises at their place of residence, some of them became heads of consumer organizations. For example, Ivanov was appointed head of the trade department in the Cheboksary district, Okhtarov became chairman of the board of the Oktyabrsky district consumer union (Semyonov et al. 1975, p. 250).

Employees of the Chuvashpotrebsoyuz made significant financial contributions to equip the Red Army with military equipment. In such a way, on July 24, 1941, an article was published in the Krasnaya Chuvashia newspaper on the decision of the authorized members-shareholders of the Kozlovsky village council of the Kozlovsky district to transfer 29,100 rubles to the country's defense fund allocated to the members-shareholders at the expense of 20% of the deductions from the profits of the village in 1940 ('Red Chuvashia' 1941). The initiators of the action urged shareholders of rural consumer societies in Chuvashia to follow their example. And this undertaking was supported by other cooperators of the republic. Members of consumer cooperation of Kozlovsky, Tsivilsky, Ibresinsky, Ishleysky districts contributed 300 thousand rubles to the Defense Fund (Chuvash regional organization of the CPSU 1989, p. 196).

The initiative of shareholders of consumer societies of the Moscow and Yaroslavl regions to transfer 20% of deductions from profits for 1941 to the construction of a tank column named after the Consumer Cooperation was supported. As of May 1, 1942, 15 regional consumer unions of the republic transferred to a special account of the State Bank deductions from the profits of shareholders for 1941 in the amount of 297 thousand rubles. Shareholders of the consumer society of the Tsivilsky district transferred 52,186 rubles, Urmarsky—27 thousand rubles, Krasnochetaysky—26 thousand rubles, Poretsky—36 thousand rubles, Yalchiksky—81 thousand rubles, Alatyrsky—18 314 rubles ('Red Chuvashia' 1941). Employees of the Kozlovsky district consumer union collected 300 rubles, Batyrevsky village of the Chkalovsky district—1300 rubles, The team of the Chuvashpotrebsoyuz transferred 1500 rubles. In total, Chuvash cooperators transferred more than 900 thousand rubles to the construction of a tank column named after the Consumer Cooperation ('Red Chuvashia' 1941). Cooperators of the republic participated in raising funds for the construction of the Komsomolets Chuvashia air squadron. The newspaper Krasnaya Chuvashia on January 30, 1943 reported on the introduction of monthly earnings by employees of the Shemurshinsky district consumer union and selpo in the amount of 8530 rubles ('Red Chuvashia' 1943). Their example was followed by employees of the Chuvashpotrebsoyuz and the Trade and Cooperative School, who contributed 5950 rubles ('Red Chuvashia' 1943).

All the activities of consumer societies of the republic were aimed at improving and strengthening the financial economy by fully mobilizing funds, which made it possible not only to provide financing for their economic activities, but also to transfer a significant part of the funds to the state. From 1941 to 1944, the Chuvashpotrebsoyuz system raised funds in the form of mutual contributions of 14,178 thousand rubles, including in 1941—2383 thousand rubles, in 1942—6604 thousand rubles, in 1943—2644 thousand rubles, in 1944—2547 thousand rubles. During the same period, profit

was received in the amount of 21,248 thousand rubles, of which 5168 thousand rubles in 1941, 5154 thousand rubles in 1942, 4726 thousand rubles in 1943, 6200 thousand rubles in 1944. This implementation of the plan for raising its own funds made it possible to allocate funds to finance the country's defense activities. During the war years, the Chuvashpotrebsoyuz system acquired bonds of the State loan in the amount of 22,252 thousand rubles (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 106–107).

Successes on the fronts made certain adjustments to the activities of rear organizations. The need for training for the consumer cooperation system was due to the resumption of the cooperative technical school. In 1943, the Council of People's Commissars of the Chuvash Autonomous Soviet Socialist Republic decided to accept the proposal of the chairman of the Presidium of the Chuvashpotrebsoyuz Terentyev to begin classes in a cooperative technical school, which it was decided to hold in one of the city schools on the second and third shifts (Essays on the history of agriculture and peasantry of Chuvashia 1989, pp. 102–103). As the occupied territories were liberated, Chuvash cooperators assisted in the restoration of their economic structures. In such a way, after the end of the Battle of Kursk, on the basis of the order of the Council of People's Commissars of the USSR of October 11, 1943, the Council of People's Commissars of the Chuvash Autonomous Soviet Socialist Republic ordered the Chuvashpotrebsoyuz to ship live goods for the collective farms of the Kursk region—4 thousand geese and 1 thousand hussands from the Kanash poultry processing plant in the account of state preparations (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, p. 103).

The Chuvashpotrebsoyuz with honor withstood the tests of the military era and managed to maintain economic potential. According to the results of the economic and financial activities of the Chuvashpotrebsoyuz system for 1945, retail turnover for trade and public nutrition was 104.3%, mutual contributions were collected by 137.2%, potato harvesting amounted to 187%, furs—164.5%, scrap of ferrous metals—104.1%. The volume of production from subsidiary farms increased: 119.8 tons of cereals and legumes were harvested, 251 tons of potatoes, 59.1 tons of vegetables, 15.1 tons of milk, 2140 eggs, and the planned indicators for individual types of production of consumer goods were exceeded (soft drinks—146.8%, shoes—164%, wheeled ointment—107.6%, bowl products—273%, cultural products—101%, household services—101%), accounts receivable reduced by 2894 thousand rubles, accounts payable—by 4302 thousand rubles, the turnover of funds and goods was significantly increased (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 106–107).

4 Discussion

With all the successes noted, the difficulties of the military era could not but affect certain indicators of the Chuvashpotrebsoyuz. For example, the work on the sale of centralized funds of goods allocated by the Central Union was not sufficiently carried

out: for the main industrial goods, funds were sold by 72.5%, for products—85.6%. The funds of decentralized sources were poorly involved in the trade turnover—the plan for them in 1945 was implemented by 87.6%. Half of the district unions (15 out of 30) did not fulfill the retail turnover plan. In the production of consumer goods, implementation amounted to 82%. At the same time, there were complaints about the quality of goods and relatively high prices. At subsidiary enterprises, a significant percentage of the incidence of pigs (10.3% of the income), low average daily milk yield (2.7 L), egg production of chickens (63 pieces per year) were noted. The bakery plan was implemented only by 81.4%, which was expressed in an annual loss of 612 thousand rubles (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 106–107).

The results of harvesting activities were low: for mushrooms—6%, buckthorn—60.6%, tannic measles—50%, non-ferrous metal scrap—60%, furrow—81.5%, lectechsourt—47.5%, wild fruits—88.2%, cabbage—86.5%, cucumbers—16.7%, tomatoes—10.7% and other. The volume of profit for 1945 13.2% of the planned indicators (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, p. 108). The reason for their non-implementation was the lack of personnel, transport, raw materials, etc. For example, Poretsky, Shemurshinsky, Pervomaisky district unions could not take out the crash due to the lack of transport. Errors were also made when planning procurement, in particular, ignoring local conditions. So, it turned out that the crash in the forests of Kanash, Vurnarsky, Ibresinsky districts grows in small numbers. There were also not enough people to procure it (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 108–109).

At the same time, Chuvash cooperators in wartime conditions showed examples of labor heroism. So, according to the results of the All-Union Socialist Competition in the IV quarter of 1942, the Sundyrsky district consumer union won the third prize, significantly exceeded the sales plan, exceeded the plan for harvesting poultry, fur raw materials, scrap metal. In addition to the plan, the district consumer union harvested 12 tons of potatoes and other vegetables, of which about half sold to families of military personnel (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, p. 102). By order of the People's Commissariat of Blanks of the USSR, according to the results of 1943, the badge 'Excellence in Blanks' was awarded to workers of the consumer cooperation of the Chuvash Autonomous Soviet Socialist Republic, who distinguished themselves during public procurement of bread and potatoes: N.S. Smykov—head of the blanks department of the Chuvashpotrebsoyuz; P.A. Koshkin—Chairman of the Sundyr District Consumer Union; A.S. Baimushkin—Chairman of the Yalchik District Consumer Union; A.P. Safonov—Chairman of the Tsivilsky District Consumer Union;

N.F. Filippov—Chairman of the Shikhazan District Consumer Union; A.M. Matveev—Chairman of the Vurnar District Consumer Union; I.F. Fedorov—Chairman of the Urmar District Consumer Union (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, pp. 104–105).

The All-Union Central Council of Trade Unions, the People's Commissariat of the USSR, the Central Union of the USSR and the RSFSR, having considered the

results of the All-Union competition of organizations and enterprises of consumer cooperation for the 1st quarter of 1944, recognized the winners and decided to issue cash prizes to the following organizations and enterprises of consumer cooperation of the Chuvashpotrebsoyuz system: by store—second prize: Chuvash-Timyashsky village store of the Ibresinsky district of the Chuvash Autonomous Soviet Socialist Republic (head of the store Sergeev) in the amount of 400 rubles, Tiushsky village store of the Morgaush District (the head of the village store Burdasov) in the amount of 200 rubles.; third prize: Karaklinsky shop of Vutabosinsky village of Kanash district (head. Egorov store) in the amount of 300 rubles, Malobikshikhinsky shop of Vutabosinsky village of Kanash district (head. Store Nikolaev) in the amount of 150 rubles (Consumer cooperation of Chuvashia: documents, materials, memories, photographs 2000, p. 105).

A number of employees of the Chuvashpotrebsoyuz in 1944 were listed in the Book of Noble People of Consumer Cooperation and awarded the badge 'Excellence in Social Union of the People's Commissariat of the USSR': I.F. Fedorov—Chairman of the Urmar District Consumer Union, A.T. Terentyev—Chairman of the Presidium of the Chuvashpotrebsoyuz Union. In total, during the war, more than 120 thousand workers of Chuvashia were awarded the medal 'For Valiant Labor in the Great Patriotic War of 1941–1945,' over 400 production leaders were awarded orders and medals of the USSR, 3630 people—Certificates of Honor of the Presidium of the Supreme Council of the Chuvash Autonomous Soviet Socialist Republic, among which were consumer workers (Mikhailov 2006, p. 295).

5 Conclusion

The Chuvashpotrebsoyuz made its contribution to the cause of Victory over fascism. Cooperators provided raw materials, various materials, food products to industry, the army and the population. They transferred money for the construction of tanks and aircraft, became donors. During the war years, the republic's cooperators collected and handed over about 3 thousand tons of black scrap metal, harvested more than 500 tons of tannic measles, sent 430 wagons of eggs and many other products. For the work carried out on the purchase of products for soldiers of the Red Army, the procurement of raw materials for the defense industry and the supply of goods to the population during the war, the Chuvashpotrebsoyuz was awarded the first prize of the All-Union Central Council of Trade Unions, the People's Commissariat of the USSR and the Central Union, many were awarded orders and medals.

Therefore, the experience of the Chuvashpotrebsoyuz during the Great Patriotic War of 1941–1945 is undoubtedly not only of scientific but also of practical interest, which can be used to ensure the stable functioning of the system of consumer cooperation of Russia in the conditions of economic transformations (Andreev and Antonova 2010; Kalinina et al. 2012; Kuznetsov et al. 2012).

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Public–Private Partnership as a Tool for Interaction Between the State and Cooperatives

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Abstract The purpose of this research is to identify the need to deepen interaction between the government and the cooperative sector of the economy on the basis of public–private partnership in order to obtain financial, organizational and methodological assistance for cooperatives, and state support in solving social problems in rural areas. The authors identify three specific areas of interaction between the state and cooperatives based on public–private partnership: system and program approaches, implementation of one of the optimal forms of interaction—agro-clusters. High flexibility of state and cooperative interaction should be provided by financing not individual cooperatives, but the system as a whole on the basis of grants, provided that the cooperatives co-Finance part of the resources. It is shown that consumer cooperatives need flexible state support in such areas as: financial, organizational and methodological activities. The problem of ensuring high flexibility of state and cooperative interaction on the basis of public–private partnership is the absence of a unified state cooperative policy and projects for the reproduction of fixed assets of cooperatives," non-recognition " by the state of the cooperative sector as an element of the market economy, etc. Providing organizational, financial, legal, methodological and consulting support to cooperatives is a promising direction for expanding the interaction of the state with cooperatives on the basis of public–private partnership. On the example of the Republic of Bashkortostan, the possibilities of providing such support based on a program approach - the implementation of a regional program that provides for its co-financing by members of cooperatives in order to create objects and get them for rent are revealed.

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JEL Classification D14 · D16 · G50 · J54 · M21 · P13 · Q13

1 Introduction

The experience of foreign countries shows that sustainable economic growth is possible with the interaction of the state and society. In order to develop the most important sectors of the economy, public–private partnerships (hereinafter referred to as PPPs) have been put into practice. However, the development of consumer cooperation based on PPP is not given due attention. Therefore, the theoretical study and practical solution of the problem of improving the efficiency of consumer cooperation enterprises are relevant and require further development. The development of consumer cooperatives will ensure the sale of agricultural products produced by the population, the supply of necessary material resources, consumer goods and services to small businesses. In our opinion, PPP is the most optimal form of development and support for both the agro-industrial complex in General and consumer cooperation in particular. PPP as a form of cooperation between the state and private business allows the latter to receive organizational and financial support from the state.

2 Materials and Methods

The need to develop cooperation in the country, its interaction with the state and the use of various mechanisms for its manifestation, including on the basis of public–private partnership, is emphasized in the works of Bartanov (2019), Bezgina (2012), Getmachuk (2011), Glatkova (2016), and others.

At the same time, despite the high level of development of the problem at the theoretical level, it is insufficiently studied at the empirical level. It is necessary to develop and implement practical measures to ensure interaction between the state and cooperatives on the basis of public–private partnership, taking into account the specifics of the functioning of territorial and administrative entities.

It is necessary to highlight such areas of public-cooperative partnership as a systematic approach, a program approach, and the introduction of agricultural clusters.

3 Results

Russia continues to modernize its economy, aimed at creating a socio-economic system capable of self-development and quality growth. The market economy includes three interrelated and interacting sectors: private, cooperative and public, the share of which is determined by the country's functioning. However, the cooperative sector is still not considered recognized by the state, which is why there is no cooperative policy.

Institutions of consumer cooperation are considered only one of the mechanisms that make it possible to increase the scale and efficiency of small-scale businesses. In addition, consumer cooperation can help meet the social needs of society.

The cooperative sector with the material, legal and organizational support of the state, is designed to occupy those economic niches that are unattractive for private entrepreneurship and burdensome for the state, for example, in agriculture. It is cooperatives that help meet the vital needs of certain categories of the population, such as pensioners living in remote and sparsely populated villages.

The cooperative sector has common and distinctive features with the state sector. Just like the state sector of the economy, the cooperative is focused on a specific person, but takes into account the interests of certain categories and segments of the population in providing them with appropriate services. The distinctive features of the cooperative sector of the economy are the less centralized nature of its manifestation, the focus on satisfying group interests, as well as the social and commercial orientation (Bezgina 2012).

The development of relations between the state and consumer cooperation can be based on a state-cooperative partnership that provides financial, organizational and legal assistance to the cooperation and support to the state in solving social problems in rural areas. State-cooperative partnership, of course, contributes to improving the provision of goods and services to the rural population, increasing the volume of purchases and processing of agricultural products (Getmanchuk 2011).

In foreign countries, the mechanism for implementing PPP projects is different and unique. In our country, only the first steps have been outlined for its application in practice: standards, the structure of agreements, the system of interaction and legislation in the field of PPP are being developed. In the agro-industrial complex, PPP development is slower than in industry, housing and utilities, and construction due to the presence of risk caused by objective factors (natural, geographical, anthropogenic, etc.). unfortunately, among the existing projects based on PPP, no projects have been developed that could provide for the reconstruction and technical re-equipment of fixed assets of agricultural enterprises. The authors consider an example of the development of public–private partnership at the local level—in the Republic of Bashkortostan.

Among other regions, the Republic of Bashkortostan stands out for its methodological elaboration in the development of cooperation. The methodological approach was developed in collaboration with world Bank consultants. The resource potential of the territories is analyzed, initiative groups are identified, and objects of

collective use are identified that are co-financed through established cooperatives, including through state support measures. It is expected that continuous support and training of cooperative members will be provided in the future. The region has a distributed support infrastructure: the Republican state budgetary institution "center of competence for agricultural consulting", the basic development Institute together with municipal "Information and consulting centers" provide support to business entities (Vartanov 2019).

Consumer cooperatives provide assistance in the development of local rural areas, preservation of rural lifestyle and traditional culture, and employment of the rural population. In the total EAP of the Republic of Bashkortostan, LPH accounts for 51.4% (87 billion rubles), SHO—38.3% (64 billion rubles), and KFH—10.3% (18 billion rubles).

In 2019, 117 agricultural consumer cooperatives were registered in the Republic of Bashkortostan. The region is one of the first among other constituent entities of the Russian Federation to start implementing revenue-generating projects for the creation of collective use of objects on the basis of co-financing of owners of private farms.

The Program "development of consumer cooperation in the Republic of Bashkortostan for the period 2018–2020" provides for legal, informational, methodological and educational support for the creation and operation of agricultural cooperatives; economic incentives for associations of small businesses in agricultural cooperatives and the implementation of initiative budgeting projects for the creation of collective use facilities; creating conditions for the development of MTB agricultural cooperatives.

Appropriated funds for the Program 1 527 million rubles, including Federal budget—264 million., funds of the Republican budget of 972 million. RUB., attracted funds—RUB 291 million.

The term of implementation of rural settlement projects is one calendar year, during which local contributions are made by members of the cooperative; agreements are signed between the cooperative, the municipal district and the rural settlement; competitive selection of contractors is held; objects are created and registered on the balance sheet of the rural settlement; objects for collective use are leased to cooperatives.

Based on the interaction of cooperatives and local self-government bodies, it is possible to create promising models for processing agricultural products:

1. slaughtering, butchering, packaging of cattle and MRC meat;
2. harvesting, cleaning, packaging of potatoes and vegetables;
3. collecting, cleaning, and cooling milk.

The economic mechanism for supporting consumer cooperation organizations is possible on the basis of the existing mechanism for allocating subsidies and grants to them. The grant for the implementation of revenue-generating projects can be up to 3 million rubles per cooperative, provided that at least 9% is co-financed. The grant is directed to the development of the material and technical base of the cooperative: purchase, repair, modernization of workshops; purchase

of equipment intended for harvesting, storage, processing, sorting, slaughtering, primary processing, preparation for sale; purchase of specialized transport for the transportation of agricultural products. In addition, itispossibletoprovidestatesupporttoruralcooperativesbyprovidingtaxincentives, reducing tariffs for gas, heat and electricity.

In order to raise public awareness, it is recommended to publish on the pages of municipal Newspapers and on the official websites of municipalities materials about the activities of cooperatives and their state support, about the experience of cooperatives in other regions.

The Republic is considering the possibility of reviving the system of consumer cooperation that existed in the Soviet era, and its accompanying additional social burden. We are talking about the creation of the Republican social and consumer cooperative "Bashkortostan". Commodity producers make contributions to the cooperative units in the form of manufactured products, individuals-in cash. In this case, the purchase and sale agreement is replaced by a share exchange agreement, that is, commodity producers (farmers) receive their buyer and guarantees for the demand for their products. Consumers have the opportunity to purchase fresh farm products without a trade mark-up. It is expected that 35 special points will appear in the capital of the Republic to serve socially vulnerable segments of the population—"patients" of complex social service centers. The idea is as follows: pensioners and disabled people served at home order the necessary goods (for example, through a call center), the social worker does not buy them in the store, but picks them up from special delivery points at significantly low prices.

Thus, the above indicates that there are positive changes in the interaction of government and cooperation. The subjects of consumer cooperation have the human and material and technical potential to effectively solve social problems in rural areas. However, there are also difficulties in the development of consumer cooperation due to the lack of a unified cooperative policy and the lack of recognition by the state as an equal participant in the agro-industrial complex. In this regard, it is urgent to develop and adopt consumer cooperation at the regional level.

Interaction between municipal authorities and consumer cooperatives should be carried out in such areas as promoting the creation of new cooperatives; providing information about auctions for the sale or lease of municipal non-residential premises for the placement of production facilities of consumer cooperatives; attracting mass media to inform the population about the activities of cooperatives; assistance in preparing documents for participation in the competitive selection of participants to provide grants for the development of consumer cooperatives for the implementation of income-generating projects and grants for the development of the material and technical base of an agricultural consumer cooperative; providing representatives of cooperatives with places to trade agricultural products produced by members of the cooperative; development and implementation of various economic schemes of interaction between According to Gladkova E., agro-clusters that take into account the possibility of reproduction of fixed assets are the optimal form of PPP (Gladkova 2016).

4 Conclusions

Cooperatives as a form of integration of small and medium-sized farms operate in an aggressive competitive environment. The state provides financial support only to individual cooperatives, but it does not support the entire system as a whole. There is no funding for the creation of financial support funds, information and consulting centers, specialized centers for training and advanced training of cooperative personnel. Of course, a non-systematic approach to the development of cooperatives can lead to the loss of independence of cooperatives and the emergence of financial dependence on the state.

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Current Challenges in Implementing HACCP at Public Catering Enterprises

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Abstract The problem of implementing the HACCP system at domestic catering enterprises was studied. The relevance of the study problem by the authors is analyzed based on the results of their own studies. It has been established that principles based on a system approach should be applied in the development and implementation of the HACCP food safety system. In favor of this point of view, both the literary and the results of the discussion of the collected material in this article testify. Isolation of one factor or individual groups of factors does not identify the underlying cause of the current risk management problem according to the HACCP principles. Inadequate management, production and hygienic practices remain in the enterprises themselves (the management of enterprises does not have a professional higher education master's level; low professional level of personnel, simulation approach to creation and implementation of HACCP system, etc.). The article discusses actions aimed at solving issues of risk management in the manufacture of safe products.

Keywords Product quality · Management · Management · HACCP · Manufacturing and hygienic practices

JEL Classification L53 · L81 · M11 · M54 · O14 · O19

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1 Introduction

A set of new methodological approaches to food quality management, including the assessment of harm and critical checkpoints (hazard analysis and critical control points—HACCP, in Russian transliteration—HACCP), was formed in the 1960s in the USA. It received its recognition in official documents of the UN and WHO on food safety.

Currently, the application of HACCP methods and principles is necessary and mandatory for catering and food industries. Therefore, in 1963, the EU adopted the Directive "On food hygiene", which postulated the implementation of risk management at critical control points (CCP). In 2001, our country approved the HACCP principles for food quality management (GOST R 51705.1-2001). In 2011, the countries of the Customs Union also adopted the technical regulation "On food safety", according to which all enterprises of the Russian Federation producing food products, including catering enterprises, are obliged to carry out their activities in accordance with the HACCP principles. However, from 2001 to 2015, catering companies did not begin to develop and implement the system of food quality assurance measures mentioned in this document. It should also be noted that GOST R ISO 22000:2007 "Requirements for organizations participating in the food production chain", which was also ignored by the leadership of the subjects of the food industry, was approved in this time period. Following it, GOST R 55889-2013 "Catering Services. Public catering safety management system. Recommendations on the application of GOST R ISO 22000-2007 for the food industry", which should be considered as an indicator of insufficient elaboration of a number of provisions of GOST R ISO 22000:2007. In this regard, it should be noted that in GOST R 51705.1-2001 there are certain unsuccessful positions (for example, the decision tree and flowcharts). Therefore, it is quite possible to agree with the opinion of individual authors (Isayenko and Korolev 2014) arguing that there are difficulties in implementation due to difficulties in understanding individual provisions. Nevertheless, the main difficulties of introducing modern food quality management are due to the human factor at the level of senior management, who does not perceive and does not want to use the principles of management and quality assurance of food products HACCP (Dimitriyev et al. 2018a, b, 2020; Isayenko and Korolev 2014). Financial, technical, managerial, organizational, educational and psychological problems may also pose difficulties in implementing these principles. However, this cannot justify the fact that many enterprises do not comply with the requirements of SanPiN sanitary rules 2.3.6.1079-01, the implementation of which is mandatory.

The analysis of scientific publications on the problems of HACCP system development, implementation and evaluation highlights the following key points:

- analysis of technological risks at critical control points has the greatest efficiency among methods of modern quality management at catering enterprises (Dimitriyev et al. 2018a);
- staff training is critical for an effective HACCP system (Dimitriyev et al. 2020; John 2006);

- the development and implementation of an effective HACCP system in enterprises ensures the minimization of risks to consumer health (Soon et al. 2012).

The purpose of this research is to study the development of modern management at catering enterprises through the implementation of the HACCP principles.

2 Materials and Method

When writing this work, the authors analyzed scientific publications and studied the practice of senior management of enterprises to implement the HACCP system in accordance with the requirements of GOST R 55889-2013 "Catering Services. Public catering safety management system. Recommendations for the application of GOST R ISO 22000-2007 for the food industry". As part of the subject of research of this work, the authors conducted a study of the labor activities of senior management of enterprises for the implementation of the HACCP system in accordance with the requirements of GOST R 55889-2013 "Catering Services. Public catering safety management system. Recommendations for the application of GOST R ISO 22000-2007 for the food industry". The research was conducted through analysis of responses to a questionnaire developed by the authors. Specialists with secondary vocational education in the field of catering technology answered the questions of the questionnaire. Respondents assessed the extent to which HACCP principles and methodology were implemented in enterprise management and management decisions. The evaluation of the measures taken by the management of the enterprise to implement the HACCP system over the past 3–4 years was carried out using the five-point Likert scale (1—not started, 2—first steps were taken, 3—positive results were noticeable, 4—significant positive results and 5—the introduction of modern management was achieved), adapted by us to the goals of our research (Dimitriyev et al. 2018b).

3 Results

This section describes the materials of the study of the problem of implementing HACCP principles in catering enterprises, collected and analyzed on the data of the questionnaire of employees of enterprises with secondary vocational education and with a working experience of 3 years or more, are given in the figure, which shows the indicators of compliance assessment for individual positions of implementation of the HACCP system according to the Likert scale.

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As shown in Fig. 1, the management of the enterprises did not begin drafting job descriptions for the implementation and operation of the HACCP system (1.2 points). Somewhat better was the formulation of the goal of compliance of management with

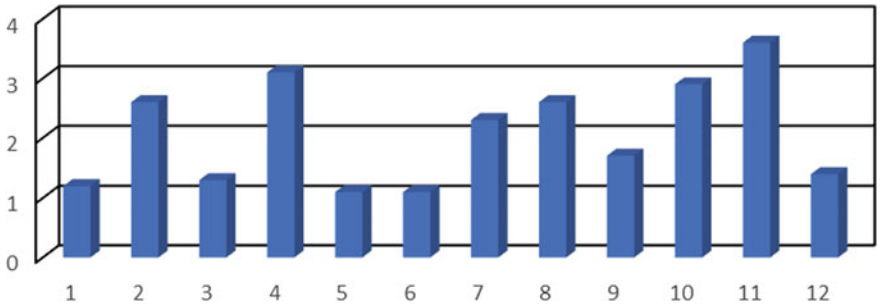

Fig. 1 An assessment by respondents of the measures taken by the management of catering enterprises to implement the HACCP system. *Source* Compiled and built by the authors. *Note* coordinate axis: results of implementation of HACCP system indicators in Likert points; The abscissa axis of the HACCP implementation activity: 1—defined the obligations of the organization's management for the functioning of the HACCP system; 2—Goals for meeting the safety requirements of catering products are defined; 3—a document management procedure has been developed to ensure the functioning of the safety management system for catering products; 4—A policy on the safety of catering products has been developed; 5—a group of safety of catering products has been formed; 6—personnel are trained in the basics of the public food product safety management system; 7—specifications for each name of catering products are drawn up; 8—updated normative legal acts, regulatory and technical documents in the field of the food industry; 9—the requirements of normative legal acts and regulatory documents for inclusion in the programs of mandatory preliminary measures are identified; 10—critical control points are identified and a monitoring system has been developed in them during the manufacture and sale of catering products in the organization; 11—the system of tracing of catering products is documented; 12—internal audits were conducted

the HACCP requirements for the safety of catering products (2.6 points), that is, the majority of enterprises did minimal work in this direction, and the first positive results were noticeable on some. The most important aspect of the management of the catering enterprise is the management of documentation as part of the operation of the product security system. As the results of our survey showed, this aspect of HACCP in most enterprises is in its infancy—the average score was 1.3, which may indicate that management has practically not started implementing this item of HACCP.

Oddly enough, the development of the HACCP implementation policy proved to be a simpler task with which most business managers were more or less successful (an average score of 3.1, that is, employees were noticeable positive results in this direction).

The organizational aspects of HACCP proved to be the weakest link in the chain of action needed to implement the food safety and quality program. No company has formed a product safety group (average response score is 1.1. The same pattern was observed with regard to training staff in the fundamentals of the organization and functioning of the food quality management and safety system (average score 1.1).

When answering the question on the preparation of specifications for each food product, the respondents noted that at most enterprises the first timid steps were taken

in this direction and only 24 respondents noted the positive results achieved in this direction (average score 2.3).

The average score for updating regulations and technical documents in this area was 2.6, which indicates that in this activity as part of the adaptation and implementation of the HACCP system at most enterprises there are certain steps and there are first positive results.

According to GOST, in order to implement the HACCP principles, it is necessary to clearly define the requirements of regulatory legal acts and regulatory documents for inclusion in the programs of mandatory preliminary measures. This component of the work was practically not done—the average response score on the Likert scale was 1.7 points.

The identification of critical control points and the creation of a monitoring system for the manufacture and sale of food products is the central point of HACCP ideology and practice. We have seen quite a wide range of answers to this question—from the complete absence of significant results to the presence of significant positive changes in this direction. The average response score was the highest at 2.9, which can be interpreted as having a more or less elaborate critical point system in most enterprises.

As you know, the transition to a new one is easier and faster if there is similar previous experience. This postulate clearly illustrates the results of the answers to the question about the availability of tracing documents for catering products, the average score of which was maximum and amounted to 3.6 points. Among the answers were even the maximum score of 5, that is, the respondents believed that the modern level of management had been achieved for this indicator.

Critical to any system is feedback, which provides maximum efficiency, flexibility and development. Such feedback in HACCP is internal audit. Unfortunately, as the results of our study showed, the monitoring of the state of the food safety and quality system in most enterprises is weak—the average score was 1.4, and among the answers, estimates 1 prevailed, that is, the management of enterprises did not begin to fulfill this task.

From the data of Fig. 1, it can be concluded that the HACCP quality control system is being implemented at catering enterprises poorly and slowly: instead of actively implementing the HACCP system, there are only very timid first steps in using modern management principles. This is indicated by the fact that no HACCP implementation measures have achieved a five-point Likert rating. Based on the data obtained, a negative assessment should be made of the activities at catering enterprises to introduce a modern system of food quality management and safety based on HACCP. Under these conditions, the consumer, by purchasing a culinary product, is at risk of eating a poor-quality product and related health disorders.

As part of the discussion of the materials received in this work, taking into account the literary data in the field of modern quality management, we substantiate below the factors that hinder the implementation of the HACCP principles at catering enterprises. Control over risks specific to catering enterprises in different countries through the development and application of HACR has no national characteristics (Isayenko and Korolev 2014; Motarjemi and Lelieveld 2014; King et al. 2017; Soon et al.

2012; Zanin et al. 2017). Accordingly, judgments on the impracticality of harmonizing domestic regulatory documents with international documents in the field of food quality management based on the HACCP principles (a judgment of this order is often present in media materials) do not have any scientific basis. However, identifying the risks that arise during the development and implementation of HACCP as the basis of a food safety system is a necessary universal condition for making sound management decisions in restaurants, cafes, etc. Enterprise managers are often interested in the financial results of enterprise management, do not take into account their responsibility for the quality and safety of food and services to consumers (Dimitriyev et al. 2020). Our data also suggest that product risk management does not sufficiently use universal staff motivation mechanisms (Akifyev and Ponomareva 2017), which could be the main tool for developing and implementing the HACCP system.

One of the reasons for this situation is the existing practice of supervision of state supervisory bodies, which does not motivate the heads of enterprises to fulfill the requirements set forth in regulatory documents (Dimitriyev et al. 2020). The preservation of such practices does not ensure the safety and quality of food products, i.e. violates the constitutional rights of citizens of the Russian Federation (Onishchenko 2013).

The negative assessment obtained in this work of the activities of the management of catering enterprises to introduce a modern, HACCP-based product quality management system is also a consequence of the lack of preparation of managers and staff for the implementation and operation of the HACCP system. Inadequate management, production and hygiene practices in enterprises persist. Managers of enterprises do not have a professional higher education of master's level, as required by professional standards. This largely explains the reason for the simulation approach to the creation and implementation of the HACCP system.

The scientific discussion raised on the issue of the lack of harmonization of HACCP requirements with the regulatory framework of the Russian Federation was reflected in a new document—Sanitary Rules and Norms 2.3/2.4.3590-20 "Sanitary and epidemiological requirements for the organization of public catering", according to which compliance with the HACCP principles is a prerequisite for the functioning of a public catering enterprise.

In this respect, the status of a number of official documents in the field of product quality should be reviewed in the future, which to date, as shown by the practice of their applications, are considered as advisory. Addressing these issues would be an effective factor in improving economic and legal mechanisms for the responsibility of the management of catering enterprises for the quality of food produced.

4 Conclusion

The article provides an overview of scientific work in the field of site assessment and the role of the HACCP system. It is shown that the HACCP system has an effective universal mechanism for managing the quality of food products.

Our research on food quality management suggests that food safety policies based on HACCP are not sufficiently implemented by catering managers. Accordingly, improper production and hygiene practices are the most common, making it impossible to incorporate HACCP principles and methodology into catering practices. The article discussed issues of harmonizing HACCP requirements with the regulatory framework of the Russian Federation and improving the mechanisms of responsibility of senior management of catering enterprises for the quality of products.

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The Influence of Anti-Covid Regulations as a Factor in the Reproduction of the Shadow Economy: Management and Marketing Aspects

Natalya V. Demianchenko, Nadezhda A. Monakhova, Svetlana N. Zagnitko, Natalia N. Zubareva, and Vasiliy V. Chaplya

Abstract This research analyses the impact of changes and the formation of economic regulations in healthcare in the implementation of antique policies, as a factor in the reproduction of the shadow economy from the position of a structural and reproducible approach to the analysis of the shadow economy. The violation of the established system of control relations in the field of health care in the context of the implementation of an anti-criminal policy, manifested in the transformation of existing and the formation of new economic regulations, should change the structure and volume of the shadow economy in this area. In our opinion, not to see and not to notice the objective trends of the structural and reproducible dynamics of the shadow economy depending on anti-Covid measures is an inexcusable omission of modern scientists of economists, because the transformation of existing and the formation of new economic regulations in the field of health care can help to visualize the abstract world of shadow economic relations with its inherent contradictions and inherent internal logic of development.

Keywords Anti-Covid policy · Shadow economy · Reproduction of the shadow economy · Health care · Economic regulations

JEL Classification 13 · D0

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1 Introduction

Anti-Covid politics in the modern world has taken back the problems of the economy relevant in previous periods.

If the activities of departments to combat the theft of socialist property under the socialist economic system were provided with both class ideology and the methodology of dominant economic thought, then with the market transformation of the domestic economic system, the old methodological base was destroyed, and the new one was formed on the basis of Western scientific views on the problem of the shadow economy.

Thirty years of combating the shadow economy have passed since the initial copying of foreign approaches, a gradual awareness of the national specifics of the shadow economy, the identification of internally inherent and systemically inherent factors in the dynamics of shadow activity.

This allows us to move from empirical research to a deep analysis of the essential relationships and interdependencies of the structural and reproductive dynamics of shadow economic relations in specific areas of the national economy.

Here, it is necessary to clarify, the objective reality of the time of anti-Covid policy measures is a historical analogy of the transformational period of the late twentieth century, precisely because of the transformation of existing ones and the formation of new economic regulations. And the fact that not the entire economic system is analyzed, but only the health sector, this allows us to abstract from the macroeconomic distortions associated with the activities of political forces and the lack of information, but we believe that the scientific results of this study will contain generalizations that will improve the quality of tools for analyzing the shadow economy as a whole.

2 Literature Review

As noted above, during the transition to a market economy, ideological attitudes that form a holistic view of the problem of the shadow economy were much lost as a socially dangerous phenomenon.

First of all, at that time, interest in foreign publications by scientists of Soviets analyzing the specifics of the Soviet shadow economy, whose work became available, as a result of the liberalization of economic thought, increased (Grossman 1977; Katsenelinboigen 1977).

The works of these authors served as an intensification of the shift in the scientific paradigm, since they introduced into the scientific discourse the issues of inefficiency of the legal sector of the economy of the socialist economic system and the ethical rehabilitation of participants in shadow economic relations of the Soviet period, as a process of struggle of progressive, initiative market entities with remnants of the

command economy. The authorship of the term is attributed to Gregory Grossman (Grossman 1963).

The result of these studies was a scientific understanding of the objective growth of economic crime on the basis of the wide development of market economic relations and the formation of a system of relations of private ownership of means of production.

The legal approach to the analysis of the shadow economy made it possible to distinguish the illegal sector as an antipode of the legal economy (Makarov 2003).

The scientific analysis of the shadow economy, as economic relations, was extremely scarce during this period, where factors of the dynamics of the shadow economy were revealed from the position of interests, participants in such relations.

I would like to draw attention to the fact that at the first stage, in most cases, the authors fell into a "methodological trap" the result of which was an unnecessary complication of the categorical apparatus and the construction of unpromising schemes for the structure of the shadow economy. We believe that this was due to the narrowness of the methodology of Western authors and the lack of holistic methodological tools that can penetrate the essence of the economic nature of shadow economic relations.

It was on the analysis of the industry specifics (health care) of the shadow economy that the authors focused their attention in this article.

Among the works, the main area of interest in this problem in research can be noted the issues of informal payments for medical services (Fatkhutdinov 2015).

To date, there has been no work on the analysis of the impact of changes and the formation of economic regulations in healthcare, in the implementation of anti-covert policies, as a factor in the reproduction of the shadow economy from the perspective of a structural and reproductive approach to the analysis of the shadow economy.

3 Methodology

The tools for analysis of shadow economic relations, in practical application, are based on the institutional concept of market relations. However, in its historical forms, the shadow economy is not limited to market relations.

Firstly, the market form in its integral form is relatively young, although the principles of the market structure can be found in pre-capitalist formations, as lacunar facts of economic ties.

Secondly, in the course of earlier studies, a system of historical forms of shadow economic relations was highlighted: the forms of the previous, emerging ways, and the corruption form, as economic relations of control (Chaplya 2014).

The previous ones include: the primitive community system, the slave-owning, feudal, capitalist, socialist formations (in their historical specifics, and the ideological set of principles of economic management).

Economic regulations in the shadow economy can be both antagonistic and conformist in relation to the legal.

The subject, going beyond the historically defined legal regulation, in the form of an economic alternative, falls into the sphere of shadow economic relations, where the degree of involvement in these relations can be both tightly regulated (organized crime) and be episodic, without high barriers to entry and exit (informal employment).

The methodological basis of this research is based on the information given above.

4 Results

The health system in different countries is based on different principles of economic regulations. Market and non-market regulations of the medical services market can be distinguished.

Considering the analyzed sphere from the position of the base coordinate system, it can be noted that it is characterized by the interaction of supply and demand and depends on the type of market.

From this, in relation to the structural and reproductive approach of analysis of the shadow economy in the field of health care, it can be concluded that the shadow regulation is an alternative to the existing economic model.

For example, in the socialist model of healthcare, the shadow practices of interaction included medical services, the demand for which the modern market economy satisfies in the form of legal regulations—paid medicine, which in its physical and cost volume significantly exceeds the volume of the shadow economy in this area under the socialist economic system. Conversely, in the market conditions, condo forms of shadow relations are formed, based on non-market principles of management.

The question is legitimate if the demand for medical services is more fully satisfied in the aggregate of the legal health system (CHI) and subjects of paid medicine, why has the shadow economy in health care not disappeared?

The disclosure of the nature of the forms of the shadow economy allows us to identify the trends in the structural and reproductive dynamics of the shadow economy depending on anti-policy measures in the field of health care.

We will reveal the objective side of shadow economic relations through an analysis of the subjective composition of control relations in the field of health care, as the place of collision of legal and shadow regulations, or the clash of public and private interests.

It can be distinguished within the framework of legal and shadow regulations of the following entities (Table 1).

Infrastructure personnel not directly related to the provision of medical services carry out their activities both within the framework of legal regulations (official and official duties) and within the framework of shadow regulations. In fulfilling their direct duties, representatives of this group control, within the framework of their functionality, the movement of value, as well as in the conditions of anti-Covid policy, this resource is extremely highly valued and can legally be located on the territory of a medical institution. Therefore, being within the framework of the legal

Table 1 Content of the subject composition of control relations in the field of health care within the framework of legal and shadow regulations

	Legal regulation	Shadow regulation
Patients	+	+
Infrastructure staff of medical institutions	+	+
Junior and intermediate staff	+	+
Attending Physicians and Specialists	+	+
Management of medical institutions	+	+
Officials of Health Ministries and Departments	+	+
Generalized entities providing paid medical services	+	+
Informal subjects (nobility, representatives of non-traditional medicine, etc.)		+

Source Complied by the authors

regulation by form in their content, specific activities can use the alternative of a shadow one.

Junior and intermediate staff also carry out their activities both within the framework of legal regulations (official and official duties) and within the framework of shadow. At the same time, both sanitary and medical manipulations and actions are functionally available to him, and the middle one also has access to medical drugs, equipment and patient information.

Treating doctors and specialists have a significantly wider functionality within the framework of legal regulation, a greater amount of information and have the right to make a decision in compliance with the rules. Replacing formal rules of communication with patients with alternative regulations and creates conditions for informal payments of grateful patients. In the context of anti-Covid measures, one feature of the above groups can be noted—this is the regulation of the use of protective equipment in general and masks in particular, which act as anomisers of violators of legal regulations.

The management of medical institutions, not exceeding the limits of their legal regulations, is functionally able to compete with representatives of the above groups, depriving them of part of the shadow income, but this does not happen due to the impossibility of this form of income to compensate for the risks and time losses that arise. This does not mean that these entities have no alternatives to legal regulations. The set of shadow regulations is as wide as possible.

Officials of health ministries and departments do not directly interact in the system of a patient doctor, but they functionally monitor the health sector as part of the implementation of legal regulations. And although in the shadow regulations there are primitive forms and only emerging, the economic interest of these entities is mainly concentrated in the corruption form of shadow relations. Generalized entities providing paid medical services within the framework of legal regulations on a reimbursable basis satisfy the demand of patients, and they may well remain within the

framework of legal regulations. However, they also have an economic alternative, it is not important that it is formed due to the need for competition or the greed of businessmen from medicine. We also note that the legal regulations of these entities are characterized by the status of the owner, which not only gives the right to profit, but also imposes the burden of the owner.

In general, it can be stated that changes in the legal regulation of health care during the period of anti-criminal measures create conditions for an expanded reproduction of the shadow economy and a change in its structure.

Why is the reduction of some structural elements of the shadow economy and the growth of others leads to an expanded reproduction of the shadow economy as a whole?

We will try to answer this question using the example of anti-Covid measures, such as the closure of part of medical institutions for quarantine and the reprofiling of others into specialized ones. Obviously, as a result of these events, the legal regulations have changed significantly. Namely, the averality of measures, the blurring of legal regulations adopted, the increase in the non-mandatory implementation in percentage, leads to a greater percentage formation of shadow regulations. Or the percentage of the legal regulation leads to its replacement in a larger percentage of the shadow regulation.

In medicine, this can be imagined as a standard developed by socially recognized labor, and voluntary explanations based on the economic status of the patient.

There are objective differences in the structure and work of the body of people, and there is a difference in approaches between medicine and health care.

This difference is manifested in the form of a "problem" of choosing whose life is of great value. Not by declaration, but by practical implementation.

In our opinion, this is one version of what can explain the social differentiation of the form of the Covid flow.

The problem of the patient's perception of the actions of doctors, administrative and infrastructure workers is disbelief.

Trust in the health care system, a kind of medical compliance lost during the period of anti-Covid interventions, not only pushes patients to find an alternative to legal regulations, but also undermines confidence in upcoming vaccine interventions.

5 Conclusions

Given the above, it can be noted that time is objectively as a physical quantity, and economically, it is absolutely a limited resource. If we present the economic regulations as a combination of the legal and shadow parts, it will become obvious that the subject who is completely in the legal sphere does not have time for the shadow part of the economy as a whole. He must, due to his time in the legal sphere, replace the legal regulation with shadow. It is the disorganization of legal regulation and the health system during the period of anti-Covid measures that is the reason for the expanded reproduction of the shadow economy.

We believe that this approach will reveal the trends of expanded reproduction of the shadow economy in other areas, when analyzing the temporary structure of economic regulations.

This approach is devoid of the shortcomings of the previous ones due to greater objectivity, since it is based on a temporary structure.

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On the Urgency of the Application of Interim Measures by the European Court of Human Rights

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Abstract In the European system of human rights protection, the institution of interim measures is a unique mechanism designed to ensure the effectiveness of the protection provided by the European Convention on Human Rights (European Convention for the Protection of Human Rights and Fundamental Freedoms in Assembly of Legislation of the Russian Federation. 08.01.2001. № 2. Article. 163, 2001). At the same time, the most important component of this mechanism is the possibility of quickly considering the request for interim measures and issuing a certain measure as soon as possible. The vast majority of interim measures taken by the ECHR relate to cases of deportation or extradition, but there are a number of examples of the application of interim measures to save the life of the applicant, which are the need to provide the applicant with urgent, specific medical treatment. The article examines the latest practice of the European Court of Human Rights in granting interim measures of emergency medical care to applicants. The article focuses on issues related to the need to exhaust domestic remedies for the purpose of applying interim measures, as well as the possibility of submitting a request for interim measures before submitting a main complaint to the ECHR. It is concluded that the Court, when assessing the urgency and inevitability of the risk of irreparable damage to the applicant, independently assesses the need to resort to any domestic remedies. It is emphasized that interim measures can be applied in exceptional cases and should be directly related to a complaint under article 34 of the Convention for the Protection of Human Rights.

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JEL Classification H87 · K33

1 Introduction

The Institute of Interim Measures is a procedural mechanism that is usually used by international judicial authorities to preserve the equality of rights of the parties until a final decision is made in a case. However, this institution is of particular importance in the monitoring mechanisms for the observance and protection of human rights, since there is often an urgent need to prevent serious violations of human rights, when the consequences of such violations can be irreversible for the applicant, if you expect a decision on the merits of the case to be made by an international body, becoming, in fact, an independent sub-mechanism in the system of protection of human rights.

In the European system of human rights protection, the institution of interim measures is also a unique mechanism designed to ensure the effectiveness of the protection provided by the European Convention on Human Rights (hereinafter the Convention). At the same time, the most important component of this mechanism is the possibility of quickly considering the request for interim measures and issuing a certain measure as soon as possible.

2 Materials and Methods

The work of the European Court of Human Rights is governed by the Convention and the Rules of the Court. Therefore, under article 39 of the Rules, the Court has the power to indicate to the parties any interim measures it deems necessary in the interests of the parties or of due process. Accordingly, the Court may grant interim measures to any State party to the Convention, and this may be done by the Court at any stage of the proceedings.

In 2019, the Court rendered 1,570 decisions on interim measures (in 2018—1,540 decisions), while the Court granted requests for interim measures in 145 cases (compared with 143 cases in 2018) (ECHR 2020). Although neither the Convention nor the Rules of the Court directly define the scope of application of this institution, it follows from the practice of the ECHR that interim measures of protection are applied only in limited cases and most of them relate to expulsion and extradition. Thus, interim measures are applied when the complainants fear for their lives (article 2 of the Convention) or when there is a possibility of torture or cruel (inhuman) treatment against the complainant (article 3 of the Convention). In more exceptional cases, such measures may be applied in situations involving the right to a fair trial

(article 6 of the Convention) and the right to respect for private and family life (article 8 of the Convention).

Although the vast majority of interim measures taken by the ECHR relate to deportation or extradition cases, there are a number of examples of the application of interim measures to save the life of the applicant, which are the need to provide the applicant with urgent, specific medical treatment.

This study is based on works such as Sicilianos and Kostopoulou (2020), Cameron Miles (2017) and Macdonald (1992).

The authors also used the materials from Factsheet on Interim Measures: European Court of Human Rights (Council of Europe, Strasbourg 2020) and Practice Directions on Requests for Interim Measures (http://www.echr.coe.int/Documents/PD_interim_measures_ENG.pdf).

3 Results

The latest striking examples of the urgent application of interim measures in the presence of a threat to the life and health of the applicant, not related to expulsion and extradition, are interim measures issued in favor of politician Alexei Navalny on August 21, 2020, as well as a number of interim measures issued in 2020 aimed at providing the drug "Spinraza" to children from Russia suffering from spinal muscular atrophy (CMA).

Therefore, on August 21, 2020, the ECHR received a request from representatives of Alexei Navalny for the application of interim measures under Rule 39 of the Regulation, aimed at allowing Alexei Navalny to be taken to the Sharita Hospital in Berlin for treatment, since otherwise he faces a risk to his life and health in violation of Article 2 of the Convention. On the same day, the ECHR granted this request and indicated to the Government of the Russian Federation the need to apply the following measures before noon on August 22, 2020: (1) ensure that the applicant's family (wife) has access to his medical record from the hospital in Omsk; (2) to ensure that practitioners appointed by the applicant's family have access to him/her for examination and conclusion as to whether the applicant is suitable for transfer to Germany for further treatment; (3) to inform the Court of the treatment that the applicant receives, if any, and of its current condition. The court also requested by August 24, 2020 by 14:00 (French time) from both parties a report of doctors with the necessary knowledge of the applicant's suitability for transportation to Germany, if necessary in an airplane with medical equipment. In fact, the Court thus set a specific time frame for the enforcement of interim measures. On August 22, 2020, Alexei Navalny was transported to Germany for treatment at the Sharite Hospital in Berlin. After that, on August 24, 2020, the Court decided to cancel the relevant interim measures.[1]

[1] The European Court of Human Rights has lifted the interim measure granted in favour of Aleksey Navalnyy // Press release issued by the Registrar of the Court ECHR, 236 (2020), 24.08.2020.

In addition, in 2020, the ECHR granted 5 requests for interim measures for six children from Russia with SMA (https://www.kommersant.ru/doc/4493617).

So, in May 2020, the ECHR obliged the Government of the Russian Federation to urgently provide 6-month-old Ada Keshishyants from the Stavropol Territory with the expensive drug "Spinraza"; in August 2020—six-year-old sisters Alexander and Valery Azarchenkov from the Bryansk region, as well as fourteen-year-old Valery Krylov from the Amur Region, in September 2020—eleven-year-old Yegor Yesayan from the Krasnodar Territory and nine-year-old Maria Dedkova from the Bryansk Region. In these cases, the regional authorities refused to fully provide children with the Spinraza drug, while the district courts issued court decisions confirming the right of children to receive expensive medicines prescribed by medical commissions for medical reasons at the expense of the budget of the constituent entity of the Russian Federation. As a result, representatives of the applicants submitted relevant requests to the ECHR under Rule 39 of the Rules, which requested measures to ensure urgent access to the necessary treatment. At the same time, in the case of Ada Keshishyants, the request was sent and was granted before the consideration of the case in the appellate court. Requests for interim measures in the remaining cases were made and granted after appellate proceedings.

In the context of the Court's application of these interim measures, it is important to consider separately the following essential characteristics of this institution within the framework of the European human rights protection system.

First, it is worth emphasizing that when applying for interim measures, the standard of justification for a request is lower than those that exist when deciding on the admissibility of a complaint or on the merits. In this case, the person must demonstrate that there is an inevitable risk of irreparable harm. In other words, in order for the Court to apply interim measures, the following conditions must be met: (1) the reality of risk; (2) imminent injury; (3) irreversibility of harm in case of risk realization (Stepanova et al. 2020). Since the applicant has the primary (prima facie) burden of substantiating the request for interim measures, copies of domestic decisions, together with other supporting documents, should be attached to it. The requirement of inevitability means that the applicant must use accessible and effective national remedies (Keller and Marti 2013). In this case, however, there is no formal obligation to exhaust all national remedies, the degree of inevitability of risk and, accordingly, the need to resort to any domestic remedies is assessed by the Court when considering a specific request.

Whether risk is inevitable depends on the nature and circumstances of the case. However, urgency is also the reason that decisions on interim measures do not specify the grounds for their adoption. In the case of Alexei Navalny's serious condition, the ECHR apparently considered that the situation required such an urgent intervention that the applicant did not need to use any domestic methods of protection, in particular in any way challenging the decision of the doctors of the hospital in Omsk that Alexei Navalny's condition did not allow him to be transported abroad for treatment.

Leaving aside this article considerations of the possible political components of the ECHR decision, from a legal point of view it is worth noting that the decision to impose interim measures against Alexei Navalny indicates that in exceptional

situations of acute and immediate danger to the applicant's life, the Court can apply interim measures without any requirements for exhaustion of domestic remedies. In such a case, it is necessary for the applicant's representatives to demonstrate the evidence obvious to the Court of the inevitable risk of irreparable harm and the ineffectiveness of domestic remedies.

If we are talking about requests for urgent medical treatment for children with SMA, then in practice, the application for interim measures is usually preceded by the use of national remedies aimed at confirming the right of applicants to receive vital medicine from the state. At the same time, we note that due to the sharp deterioration of Ada Keshishyants, the request for urgent necessary treatment was granted by the Court, regardless of the proceedings before the court of appeal.

Secondly, these decisions develop the practice of the ECHR that interim measures may involve not only refraining from any action (for example, postponing the extradition of the applicant), but also specific active actions by representatives of the respondent State (for example, providing a specific medicine or ensuring access to a hospital). It should be noted, however, that, in general, an approach has been developed with regard to interim measures by the ERP, that such measures impose on the respondent State a positive obligation to assist the Court in providing them with effective protection in a particular case. The ECHR assumes that the interim measures themselves are binding on the respondent State and, therefore, non-compliance by States with these measures leads to an automatic violation of the right to submit an application, enshrined in Art. 34 of the Convention.

The last important point to be noted is that a request for interim measures of protection may precede the submission to the Court of a duly completed basic complaint form if it contains evidence that indicates that the case may be considered by the Court on the merits (Keller and Marti 2013). In such cases, the ECHR, for purposes of urgency, applies rule 39 of the Regulation, effectively presuming that the prospective applicant will then submit a basic complaint form.

From the point of view of theory, the granting of interim measures is considered as a procedure of concurrent proceedings (incidental proceedings), that is, a procedure complementary to the main proceedings in the case. In international law, the institution of security measures is also regarded as an inherent or implied power derived from the very judicial function of an international judicial body. In this sense, it should be emphasized that the ECHR interim measures are not autonomous and should be directly related to the consideration of the merits of the case. Therefore, the applicant must either immediately accompany the request with a full complaint of a violation of the right guaranteed by the Convention, or send it at a later date. But in the event that the full complaint is not subsequently submitted, the interim measures prescribed will be canceled.

This flexibility may lead to certain procedural abuses by persons requesting interim measures. For example, there were cases in which applicants whose expulsion was suspended on the basis of ECHR interim measures went on the run. It appears that, in the case of urgent medical treatment, a situation may theoretically be created in which the actual saving of life by means of interim measures may be the ultimate interest of the applicant. In such a case, the very essence of the institution

of interim measures, which is not an independent instrument aimed at saving lives, will be distorted, the essence of which is that the final decision on the merits of the case does not lose meaning due to irreparable damage to the applicant. It appears that the ECHR, in satisfying requests for urgent medical treatment, before submitting the main complaint, presumes the integrity of the applicant, who does not intend to abuse his procedural rights and intends to continue to support his application to the Court.

4 Conclusion

Taking all the aforesaid into consideration, it should be said that in 2020 there was a new interesting practice of applying interim measures of the ECHR against Russia, which are not related to expulsion or extradition, but aimed at providing urgent medical care: transportation to a certain medical institution and the provision of a specific medicine. It can be concluded that the Court, in assessing the urgency and inevitability of the risk of irreparable harm to the applicant, independently assesses the need to resort to any domestic remedies. At the same time, such interim measures binding on the respondent States may be requested and applied before the main complaint is filed with the Court. In this case, it is important to emphasize that interim measures themselves are not an autonomous institution that can be used to save lives at the supranational level. Interim measures should be applied in exceptional cases and should be directly related to a complaint under article 34 of the Convention.

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Economic Development Tax Regulators: Range of Opportunities and Constraints

Olga S. Kirillova, Olga S. Glinskaya, Natalia M. Gazaryan, Ivan A. Chusov, and Irina S. Jararah

Abstract The purpose of the research is to develop systematic methods for determining the regulatory impact of tax instruments on the development of economic processes in conditions of increased turbulence and unpredictability, as well as to predict the vector of development of national capabilities and restrictions of tax regulation in conditions of development of digital architecture of tax processes. Tax is an integral part of our lives. Taxes are one of the state's economic levers on the economy. Both any natural person and various economic entities, regardless of the organizational and legal form, have tax obligations. All requirements for the calculation and payment of taxes are prescribed in the Tax Code of the Russian Federation. The tax system is influenced by tax classification, regional tax regulation, and industry features. The successful functioning of the tax system, built on the principles laid down by A. Smit, is impossible without tax regulators. Such, for example, include categories—tax benefits and tax sanctions, a competent combination of which affects the effectiveness of tax policy. For effective economic development, it is advisable to study and introduce tax regulators in order to increase the level of tax security, which is a component of economic security, and in the framework of public policy—national security.

Keywords Tax regulation · Economic development · Economic security · Tax instruments

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1 Introduction

Tax regulation as a management process has been the subject of scientific research for a fairly long time, having gone from exclusively applied content to treating it as an instrument that provides an indirect impact on the development of the economy. In the works of a number of foreign philosophers and economists of the XVIII–XX centuries, for the first time considering from a scientific point of view the problems of identifying taxation in the system of economic relations, the main theories of tax regulation were formulated, which determined the stage of development of these processes in world economic science (Smith 2009). Recognizing their importance for modern science, a number of issues of discussion that are still under study today should be noted. For example, the conclusion of J. M. Keynes and his followers on the unconditional impact of high levels of tax exemptions on strengthening budget revenues and ensuring the economic sustainability of the state remains widely discussed in modern conditions. More equitable is P. Samuelson's thesis about the contradictory processes of tax regulation in determining the state's fiscal policy. There is no consensus on determining the parameters of the critical level of taxation, which impedes economic growth (A. Laffer), as well as the subject of scientific discussions, the issue of the presence or absence of a linear relationship between the reduction of the marginal tax rate and the growth of budget income, which does not always take into account the imbalance between the increase in the share of personal savings and the decline in budget revenues (M. Fridman, J. Stiglitz, etc.).

The economic crises of the last two decades have contributed to the formation of a new stage of development in the world economy, the so-called "new normality," which is characterized by the turbulence of financial and other markets, a slowdown in economic growth, price volatility in conditions of high uncertainty and the development of global transformational processes. Attention should be drawn to the marked decrease in the popularity of liberal and neoconservative ideas in the global community, the inhibition of globalization processes, the digitalization of business processes in the business environment and public administration, the revival of the national identity of states and their economies (Pogorletskiy 2017).

Different countries, forming national anti-crisis programs, choose their own tax regulation tools, which determine both the prospects for economic growth and certain restrictions in determining its internal structure. Specificity is determined by the extent of the effects of the global economic crisis on the national economy. There is some unity in international tax regulation under the auspices of the OECD and the Group of 20 (G20) processes to prevent tax evasion and so-called aggressive tax planning.

The purpose of the article is to develop systematic methods for determining the regulatory impact of tax instruments on the development of economic processes in

conditions of increased turbulence and unpredictability, as well as to predict the vector of development of national capabilities and restrictions of tax regulation in conditions of development of digital architecture of tax processes.

2 Materials and Method

The results of research on the problems of tax regulation within the framework of state tax policy are given in the publications of domestic and foreign scientists. In the first decade of this century J. Slemrod wrote about lessons of tax policy during an era of "Great recession" wrote (Slemrod 2009). J. Brondolo devoted his work to the problems of tax regulation of the filling capacity of budget revenues (Brondolo 2019). J. Alworth and J. Arachi focused on the impact of crisis events on the formation of tax policy (Alworth and Arachi 2012).

The roles of international organizations, including OECD, in the international harmonization of certain tax policy issues are devoted to the works of Martens and Jacobi (2014), as well as Christians (2010).

The theoretical methods and tools offered by scientists from different countries and economic trends need coherence and focus in order to solve the problems of regulatory impact on the development of the economy.

Scenario analysis of the forecast of the development vector of national capabilities and restrictions of tax regulation in the context of the development of the digital architecture of tax processes was carried out using computer support tools.

3 Results

The analysis of the theoretical foundations of tax regulation and its evolution in the works of scientists of philosophers and economists made it possible, based on the results of their scientific research and developed practical recommendations, to conclude that the specificity of tax regulation instruments is determined by the peculiarities of the economic development of the state and the influence of world trends in fiscal policy. Changing economic realities contribute to the search for new and more effective forms, methods and instruments of tax regulation.

Modern state tax regulation as a targeted impact of the state on the behavior of tax entities by using various methods and tools to achieve the desired results (Mayburov Ivanov 2016) in the conditions of digitalization of tax and business processes is built not only as a system of measures and measures that affect the socio-economic development of the state, but, from our point of view, also on the quality of the national tax system.

The tax system is impossible without state regulation, since in any economic transaction there is a tax.

The system of traditional international tax regulators distinguishes: tax benefits and preferences in the form of full tax exemptions, a reduction in the tax base, etc.; differentiation, change of tax rates or their alternative values; changes in the composition of tax bases; and others.

In order to streamline approaches to assessing the effectiveness of tax regulators, we proposed to group them as follows: based on changes in the main elements of taxes (differentiation, change in tax rates or their alternative values; changes in the composition of tax bases; deferral and installment of tax payments), instruments of preferential tax regulation (tax benefits and preferences in the form of full tax exemptions, reduction of the tax base; investment tax credit and other investment or innovative tax discounts; tax holidays; tax amnesty), technological tax regulators (new software products; digital technologies; artificial intelligence; Big Date tax processing systems; methods of data collection and classification using Bayesian Soundlet neural network, etc. (Zavalko et al. 2020).

The use of tax regulators, as a rule, is determined by the goals and objectives that determine the achievement of the final result of their application. Most often, the analysis shows, we are talking about stimulating investment or promoting and developing a certain type of activity.

If the first two groups are based on the essential characteristics of tax payments and their elements, then the third group is due to the new technological realities and the transition to the fourth industrial revolution. An analysis of the application of tax regulators in various national economies showed that the regulators of the second group are most often used, and their development prospects are related to the third.

In the first group of tax regulators, differentiation, change of tax rates or selection of their alternative values are more significant. This contributes to the redistribution of investments in areas with a reduced level of taxation. This group of tax regulators is dominated by restrictions on their application, since they are usually associated with a direct increase in lost budget revenues and have a delayed potential effect that is difficult to measure and plan.

The second group of tax regulators, based on preferential taxation, forms the bulk of the most commonly used regulatory measures. Tax breaks and rebates have traditionally remained a major investment incentive tool and are budget tax expenditures. As a result of the study, we proposed clarifications in the methodology used in the Russian Federation to assess the effectiveness of tax expenses in terms of the use in the methodology of calculating taxes paid not only by organizations, but also by individuals.

During the period of the COVID-19 pandemic, tax regulators as the main goal of their application are aimed at maintaining taxpayers and maintaining economic stability, the sectoral structure of the economy. And in this case, the most significant are tax regulators in the form of tax deductions, deferrals and installments of tax payments, tax exemptions, tax holidays and direct tax compensation. These measures enable taxpayers to overcome temporary shortfalls in financial resources, but generally have time limits on the contingent entitled to use them. Other restrictions are possible. They belong to the category of the most "expensive" from the point of view of the economic efficiency of tax regulators and cannot be called promising.

Tax instruments arising from the use of new technologies deserve particular attention.

In particular, the introduction of digital technologies of tax administration allows, while reducing the number of tax control measures, to increase their efficiency for the budget. One of the advanced technologies among national tax administration systems is automation. The decrease in the number of field inspections is accompanied by an increase in the amount of additional charges by 1 check over the past 3 years. In particular, this is due to the use of new ACS VAT software products, a change in the conceptual basis of tax control, which allows you to plan the expected amount of possible additional charges and determine the feasibility and effectiveness of field control in relation to the company.

On the one hand, the use of digital platforms based on Big Date in public administration, the ability to process and apply them in addition to the classic statistical system and existing survey methods, improves the accuracy of economic forecasts, taking into account which are currently making the main decisions in monetary, fiscal, tariff, regulatory policies. Today, they are already partly used, and partly in the development of the "Big Data" banking system, tax and customs services, commercial platforms, etc.

On the other hand, our study showed that, in addition to the possibility of improving the effectiveness of tax regulation measures, this segment began to show certain restrictions related to the possible consequences of the introduction of new technologies. The development of smart high-tech production leads to a decrease in tax revenues to budgets due to a reduction in jobs (Goncharenko et al. 2020). Correlation of the tax system with the technological development of all segments of the economy, on the level of which the composition and structure of taxes and mechanisms of tax regulation depend the necessary component of the development of the tax system.

The current financial and economic situation, characterized by an acute shortage of budget funds for the implementation of many state programs and projects, provokes volatility in the fiscal legal space.

4 Conclusion

Therefore, the research made it possible to justify a systematic approach in determining the regulatory impact of tax instruments on the development of economic processes in conditions of increased turbulence and uncertainty, including in the context of the proposed three groups of tax regulators: based on changes in the main elements of taxes, on preferential tax regulation and on new technologies and digital mechanisms. Identify their capabilities and limitations. As a result of the study, we proposed clarifications in the methodology used in the Russian Federation to assess the effectiveness of tax expenses in terms of the use in the methodology of calculating taxes paid not only by organizations, but also by individuals. The restrictions of the techno-regulators of the tax sphere are formulated.

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Ensuring Economic Security of Economic Entities

Vladimir I. Elagin, Julia V. Pavlova, Elena Y. Levanova, Iraida V. Grigorieva, and Artur A. Semenov

Abstract This article explores the essence of the concept of economic security and factors influencing the formation of economic and financial security of economic entities operating in rural areas within the framework of the system of consumer cooperation. The results of the correlation analysis of cooperative organizations show that such factors as integration, competitiveness, marketing, investment, diversification significantly affect the formation and preservation of the security of the business entity both financial and economic. During the research, the main directions of ensuring the reserve of economic strength of economic entities were determined, such as a systematic and consistent approach to the production and marketing of products (analysis and planning of markets, consumers, competitors, products). The systematic and consistent organization of the sales policy contributes to the quality of the needs of buyers, the timely introduction of changes in the sales procedure and the rational use of financial resources; improving the investment policy of the business entity, aimed at more effective development of local and regional markets; rational interaction (integration) by rural economic entities (personal subsidiary and farm farms, agricultural cooperatives); effective use of the competitive advantages of consumer societies (own material and technical base and trading enterprises, diversification of activities, stable ties with raw materials suppliers).

Keywords Sustainable development · Economic security · Financial sustainability · Investment · Economic entity · Consumer society · Financial security

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1 Introduction

The relevance of the topic is that the identification of market factors for ensuring the reserve of economic strength (RES) of food production enterprises, in the context of constantly changing market conditions, is of important theoretical and practical importance for their sustainable development. The study of factors and techniques for increasing the financial sustainability of cooperative organizations located in rural areas was devoted by many scientists and practitioners. Among Russian scientists it should be noted Elagin and Borisova (2012), Kisurkin et al. (2010), Korotkova (2017), Kudryashova (2017), Romanenko (2017), Ilyina et al. However, not all factors related to the multi-sectoral specificity of the activities of consumer societies in market conditions have yet been investigated.

The legal position of these organizations is determined by special laws, as well as the Civil Code of the Russian Federation, the norms of which apply to them in part that does not contradict special laws. In the Russian Federation, there are business entities that are called consumer cooperatives. Meanwhile, an analysis of their status does not allow us to conclude that these organizations are non-profit corporations. First of all, this applies to consumer societies established under the Consumer Cooperation Act.

2 Materials and Methods

In the course of research, the objects were economic entities of the Chuvash Republic in the field of food production and multi-sectoral consumer society of the Chuvash Republic Consumer's Association system. Methods used: correlation—when determining the degree of influence of factors on the financial result of the enterprise; logical—was used to set the goal and define the tasks of analysis; a systematic approach is used in determining a number of factors that influence the formation of the economic and financial result of the activities of economic entities; the situational approach was applied in the search for reserves for increasing economic strength.

3 Results

The results of the analysis of the data of the Territorial Body of the Federal State Statistics Service for the Chuvash Republic for 2014–2019 indicate to us that in the sectors of the economy there is still a high percentage of unprofitable enterprises (29–31%), and in the field of food production (21–18%) for the period under review.

In value terms, the annual loss for 2014–2016 averaged 58,704 million rubles, for 2017–2019—61,570 million rubles.

It should be noted that in the republic there are many positive examples of profitable work of organizations providing services to economic entities of the agro-industrial complex. Thus, the main economic indicators of CJSC "Capital-Leasing" are as follows, thousand rubles. On average per year:

- revenue from sales of 2014–2016—306,209, 2017–2019—381,638;
- cost of sales 2014–2016—203,762, 2017–2019—280,211;
- gross profit 2014–2016—102,447, 2017–2019—101,427;
- profit from sales 2014–2016—99,449, 2017–2019—97,334;
- net profit 2014–2016—10,781, 2017–2019—41,521.

Characterizing these data, it should be noted that the indicators of 2017–2019 compared to 2014–2016 changed as follows: gross profit almost did not change; Profit from sales decreased by 2.1%; net profit increased by 3.9 times, sales revenue increased by 24.6%; and the cost of sales increased by 37.5%; Therefore, despite a slight increase in costs, net profit increases. This is a positive trend for this object.

In order to sustainably increase the economic strength reserve, it is necessary to assess, among other things, the financial stability of the economic entity. In addition to absolute indicators, the financial sustainability of the food company is reflected in the relative indicators (so-called financial ratios) that we also considered in the course of the analytical work. The data of the coefficient of autonomy, coefficient of financial dependence, coefficient of maneuverability of equity, coefficient of financial stability, coefficient of financing, coefficient of financial leverage, coefficient of security of working assets with own funds, investment coefficient make it possible to conclude that OJSC "Bouket of Chuvashia" during the analyzed period the financial situation has improved relatively, as shown by the positive dynamics of a number of coefficients. However, some factors are not yet in line with the regulatory indicators, which indicates that the financial situation of the enterprise is unstable. The main reason for the instability of the financial condition of this enterprise is the lack of equity and the predominance of borrowed funds in the capital structure, which is primarily associated with the active investment activities of the enterprise. The investment strategy was designed for 7 years, but its implementation is still only in the fourth year.

The results of the correlation analysis of cooperative organizations indicate that such factors as integration, competitiveness, marketing, investment, diversification significantly affect the financial result of the business entity. Thus, the factor of rational marketing organization affects profit by 14% (the correlation coefficient, for example, is 0.37, while this factor is determined by about 14% ($d = 0.14$) of variations in the effective characteristic). Studies have shown that there is a close link between the level of organization of integration and the availability of profit at the disposal of the cooperative organization. The rational organization in rural areas of purchases of agricultural products from farms and private farms makes it possible to fully utilize the production capacities of multi-industry enterprises of the consumer cooperation system. Such a system of organizing work in rural areas for

procurement and production activities forms and affects the economic security of a rural cooperative organization. The correlation coefficient, for example, 0.26 shows the presence of a direct relationship between these indicators, while our taken into account factor is determined by 7% of variations in the performance characteristic. The role of investment in the activities of rural cooperative organizations also shows a high dependence (the correlation coefficient in this case is 0.28, the factor taken into account is determined by 8% of the variations in the performance characteristic).

The successful identification and consideration in the daily work of these and other factors allowed the cooperators of the Urmar district of the Chuvash Republic Consumer's Association to increase the efficiency of the main sectors of the organization, thereby increasing their economic security. So, by the end of 2019, the share in the revenue of the cooperative organization amounted to 8%: the procurement industry, production—11%, trade 78%, catering 6%. The share of industries in the total profit of consumer society is 1%, 7%, 87%, 5%, respectively. The cooperative organization for the analyzed period (2014–2019) has noticeably improved indicators in the main sectors of activity. The economic strength reserve has also improved. In 2019, compared to 2014, RES increased: procurement organization 1.7 times; production—2.1 times; trade—1.1 times; catering—1.3 times; by organization—1.3 times.

Today, many Russian economic entities face financial security. As our research has shown, it is investment activity that is a factor that forms the economic security of the economic entity in the strategic future. An investment strategy is a condition for success in achieving economic security. But as our studies showed, there is a decrease in the investment activity of economic entities in the countryside. Financing activities are most often linked to their operational activities rather than to long-term investment objectives. Attention is not paid to the development and implementation of the investment strategy. This may ultimately lead to a loss of economic security.

The availability of sources of investment financing and their value also affect the volume of investment activities. So if in developed countries about 25–30% of investments are financed through profit, then in the Russian Federation in 2014 20% of investments were financed through profit, and in 2019—17.1%.

The reason is that about 40% of enterprises and organizations are unprofitable, and the level of profitability of the rest is insignificant. In addition, profits as the most dynamic element of taxation are subject to some degree of "market considerations", both by producers and tax authorities, as a result of which "rules of the game" are constantly changing.

The amount of return on investment financing is determined when it is distributed in the financial plan. The regime of the share of the distributed profit for today is determined by economic entities independently: on productive development or on social development. But at the same time, enterprises must take into account that profits aimed at developing production ultimately lead to an increase in the mass of profits.

In such a way, in economically developed countries, up to 70–80% of investments are financed through depreciation deductions. The share of depreciation in the structure of sources of financing of investments in fixed assets in the Russian Federation in 2014 was 25.7%, and in 2019—37.9%.

Therefore, at the expense of own funds, 45.7% of all investments were financed in 2014, and 55% in 2019. But for further successful development, increasing their activities and increasing economic security in a stable economic situation, economic entities, in addition to their own funds, use attracted sources. Therefore, the share of attracted sources in the structure of financing investments in fixed assets in the Russian Federation in 2014 amounted to 54.3%, and in 2019—45%. At the same time, the share of bank loans as attracted sources in the structure of financing investments in fixed assets in the Russian Federation in 2014 amounted to 10.6%, and in 2019—9.8%. As our research showed when external risks increase, economic entities in order to maintain their economic security are forced to finance long-term investment projects mainly only from their own funds, while attracting external sources is reduced. Otherwise, economic entities, when external risks increase in order to maintain their economic security, simply refuse to implement long-term investment projects, thereby reducing their production activities.

4 Discussion

Considering the multi-sectoral security problem, E.A. Arustamov notes "The more the state will be economically and food independent, the better for the countrys economy, its population and their security in general" (Golden Fund of Scientific Works of Scientists of the Russian University of Cooperation). Stressing the need for effective development, ensuring the transition of consumer cooperation organizations to the stage of sustainable economic growth. N.V. Borisova focuses on "the organization of management and marketing, ensuring the competitiveness of economic entities and products, the formation of investment policy, the development of integration ties" (Borisova 2013). Developing the proposals of the previous author A.V. Tkach proposes to focus the attention of scientists on "identifying the prospects for increasing the purchase and processing of agricultural products and raw materials of personal and farm farms, developing the most effective recommendations for the development of integration" (Golden Fund of Scientific Works of Scientists of the Russian University of Cooperation). Concluding the discussion on the relevance of the problem under consideration N.V. Kudryashova writes "Problems of ensuring financial security and sustainability of economic entities have now received extreme relevance" (Kudryashova 2017).

In general, we agree with the points of view of the listed authors. At the same time, we consider it advisable to take into account the factors considered by us, the degree of influence of which on the results of business entities is significant. Moreover, this approach will enable rural organizations to develop effectively and provide some economic strength.

5 Conclusion

Guided by the studies, we were able to determine the main directions of ensuring the economic strength reserve of economic entities:

- systematic and consistent approach to production and marketing of products (analysis and planning of markets, consumers, competitors, products). The systematic and consistent organization of the marketing policy helps to qualitatively meet the needs of buyers through timely changes in the marketing process and the rational use of financial resources;
- improvement of the investment policy of the business entity aimed at more efficient development of local and regional markets;
- rational interaction (integration) with rural economic entities (personal subsidiary and farm farms, agricultural cooperatives);
- effective utilization of the competitive advantages of consumer societies (own material and technical base and trading enterprises, diversification of activities, stable ties with suppliers of raw materials).

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Improvement of Monitoring Mechanism for Elimination of Deficiencies in Control Procedures

Vera V. Darinskaya, Tatyana V. Bodrova, Irina V. Bratko, Elena V. Zubareva, and Vera V. Veremeikina

Abstract The purpose of the work was to identify the best procedures for monitoring the elimination of deficiencies in control procedures, and it is necessary to develop a mechanism for collecting and processing information so that data can be used for strategic analysis in the future. In addition, it was necessary to give strategic novelty to the control function of management, and in the practical plane to improve the information architecture of an economic subject in such a way that:

- to monitor changes in a timely manner to maintain an optimal management structure of medium and large scale enterprises;
- timely recording of changes in the main factors affecting the effectiveness of various control measures;
- to create on time non-hierarchical coordination structures of the economic entity on the basis of: projects, groups of performers, adhocracy, self-organizing groups and virtual networks;
- adjust existing strategic planning systems based on financial indicators and summarize information indicating that the existing monitoring system needs to be modified to improve its effectiveness;
- to improve the methodology for monitoring the elimination of deficiencies in control procedures.

The research used analysis and synthesis of the obtained information on the subject, decomposition into separate elements of the control system of the economic subject in order to objectively monitor development trends, methods of combining, etc., and then combining the previously identified elements into a whole to determine significant connections and relationships. Free and formalized interviewing of workers was carried out; a research experiment was conducted. The organizational structure of the governing bodies was modelled and the internal control system was adapted. As a result, it was possible to identify ways of improving the monitoring

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system to address deficiencies in control procedures so that the essential information required for strategic analysis and subsequent planning of activities can be collected, compiled and presented for subsequent use by those responsible for making relevant management decisions. The formalization of the results made it possible to propose a methodology for improving the monitoring mechanism to address deficiencies in control procedures.

Keywords Control · Monitoring mechanism · Strategic analysis · Control procedures · Strategic planning · Strategic management

JEL Classification M2

1 Introduction

The sources of the company's competitiveness and its viability in conditions of instability are the resources and abilities of the economic entity. At the same time, abilities should be understood as the internal potential of an economic entity, its ability to develop in a selected area of activity; consciousness activity, independence of judgment, criticality of staff thinking; the speed of the reaction, the totality of the available possibilities of the organization as a whole, etc.

Obviously, a company can only get resources and abilities in two ways: buy or create them on its own. Maintaining resource competitiveness and adaptability in a rapidly changing economic situation depends on the speed of response to changes.

An economic entity that is not capable of innovation in modern economic conditions is unlikely to remain in the market, and the basis of innovation is the creativity and creative abilities of staff. The challenge is to create a feedback system that will promote sustained development and enhance the viability of the economic actor.

In addition, the transition to optimal, non-hierarchical management structures requires the creation of a new completely different control system, the main issues of which will be: speed and accuracy of information collection and processing; development of an optimal data movement scheme in the information architecture of an economic entity; the relevance of the incoming control information and the timely change of the monitoring mechanism aimed at obtaining the truly necessary information.

Monitoring of the elimination of deficiencies in control procedures should be carried out in order to:

- control of timeliness, completeness and quality of execution of measures aimed at elimination of shortcomings of control procedures;
- timely information of interested persons (senior management and heads of structural divisions of the organization, chief auditor, chief risk manager, internal control units and others);
- ensuring timely decision-making on the revision of deficiencies in control procedures (including evaluation) and/or adjustment of remedial actions (e.g. as a result

of changes in processes, organizational structure or identification of circumstances not previously taken into account).

2 Materials and Methods

The materials for conducting the research in its theoretical part are the works of Russian and foreign authors on modern control systems and methods, including strategic control and analysis, the use of their results for making informed management decisions aimed at the future.

The materials for conducting the research in its practical part are data from several companies engaged in the telecommunications sector, organizations of various sizes and forms of ownership.

Using a systematic and integrated approach, the following methods of scientific cognition were used in the study of modern mechanisms for follow-up, collection and synthesis of data for making informed management decisions aimed at the future within the current accounting system of the organization, as well as for identifying mechanisms for adaptation in crisis conditions:

- analysis and synthesis of information and operation of control systems at enterprises of various forms of ownership and scale engaged in the field of telecommunications and other services;
- abstraction in terms of data synthesis and modeling of changing processes of monitoring control procedures, allows to develop a mechanism for improving not only control, but also to present patterns of development of management structures for each particular enterprise;
- formalization and classification of the received information, allows to identify, on the one hand, the patterns of development of the economic entity in the proposed operating conditions, on the other hand, in order to determine general trends in development at the level of the industry and service sector;
- Surveillance of service enterprises, including telecommunications, in the form of included and not included observation, i.e. carried out both by the employees of the researched organizations and by independent observers, gives hope for the greatest objectivity of the data obtained;
- The research experiment consisted in the development and implementation of a new structure of management of the economic entity and the identification, study, elimination of the difficulties encountered at each stage in the organization of control procedures and monitoring the elimination of shortcomings of control procedures;
- extrapolation made it possible to apply the results of the research conducted at one enterprise to other economic entities.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as

Borovitskaya (2018), Karpova and Karpova (2017), Kryatova (2010) and Pisarenko (2016).

3 Results

The internal control unit was directly involved in monitoring the elimination of deficiencies in control procedures. At the same time, the main measures to monitor the shortcomings of control procedures by the internal control units were:

- initiating the procedure of regular monitoring of shortcomings by sending a request to the structural units responsible for the implementation of measures to eliminate shortcomings of control procedures;
- collection and analysis of information (including supporting documents) on the implementation of measures to eliminate shortcomings of control procedures;
- updating the status of implementation of measures to eliminate shortcomings of control procedures in the developed file "Monitoring," stored on the network disk of the internal control department;
- Initiation, if necessary, of a review of deficiencies in control procedures (including evaluation) and/or adjustment of remedial measures (including development of new measures);
- informing the management of the company (organization) about the status of execution of measures to eliminate key shortcomings.

Structural subdivisions (control centers) of branches of a company (organization) with a fairly extensive branch network, represented by heads of structural subdivisions, should be responsible for the execution of measures to eliminate shortcomings of control procedures located in their area of responsibility, that is:

- ensure completeness, timeliness and quality of implementation of measures to eliminate shortcomings of control procedures assigned to employees under their control;
- in the framework of quarterly monitoring, in accordance with local regulatory documents of the economic entity, inform the internal control unit about the status of implementation of measures to eliminate shortcomings of control procedures (including the provision of supporting documentation) located in their area of responsibility;
- ensure timely information of the internal control unit (within the period established by local regulatory acts, but not later than three working days before the deadline for the implementation of the measure) about significant circumstances, which, in their opinion, can affect the implementation of measures to eliminate shortcomings of control procedures, including the need to correct shortcomings and (or) the plan of measures to eliminate them.

Organizations having in their organizational structure internal audit unit and risk management department other units similar in functionality should submit to the internal control unit on a quarterly basis:

- information on the status of implementation of measures to eliminate shortcomings identified during internal audit;
- report on the status of implementation of corporate risk management measures.

The elimination of deficiencies in control procedures is monitored quarterly.

The analysis of deficiencies to be included in the monitoring during the reporting period involves the following main points.

The internal control unit, starting from the last day of the month of the quarter for which it is planned to monitor (hereinafter—the reporting quarter), forms a list of shortcomings of control procedures for which monitoring will be carried out, for example:

- the deficiency was revealed no later than the quarter preceding the reporting;
- the deadline for execution of the action has not yet come (comes) in the reporting quarter;
- the action as of the monitoring start date has not been partially completed (completed);
- during previous periods, the control procedure deficiency was not eliminated (excluded) for other reasons.

Monitoring of the elimination of deficiencies is recommended to be carried out both for activities whose execution period falls on the reporting quarter, and for activities whose duration falls on later periods.

The restructuring of the management structure in order to improve it and the ability to quickly respond to changes taking place in the external environment and adapt internal processes to them, cause the emergence of so-called process owners, that is, those responsible for certain financial and economic actions.

The internal control department sends a request for the status of execution of measures to eliminate shortcomings of control procedures:

- to control centers departments—by sending a request on behalf of the direction manager (internal control) by e-mail (for example, MS Outlook);
- to branch offices—by sending through the electronic document management system an outgoing letter signed by the chief accountant.

The request should include: an indication of the required information and documentation, the deadline for providing a response, a full name and the position of an employee of the internal control unit with whom interaction is carried out as part of the execution of the request, as well as a list of shortcomings of control procedures, measures to eliminate them and the current status of their execution (in the form of an application), including taking into account information received from the risk management department and the internal audit unit.

A separate procedure will be to send information to the internal control unit on the status of elimination of deficiencies in control procedures.

After receiving a request from the internal control department, the head of the structural department organizes the preparation and collection of information on the status of execution of measures to eliminate shortcomings of control procedures and documents confirming the performed actions. Within usually five working days from the receipt of the request, the head of the structural unit sends a response to the internal control department (including relevant supporting documents). If the required information and/or documents cannot be sent within the specified period, the head of the structural department shall agree on a new response period with the head of the department (internal control) within the period not later than usually three working days from the moment of receipt of the request. The total deadline for preparing and sending a response as part of monitoring the elimination of shortcomings in control procedures should not exceed ten working days from the moment of receipt of the request.

Updating the status of elimination of deficiencies in control procedures also deserves separate elaboration and application taking into account the characteristics of the structural unit, however, common points can be distinguished.

After receiving information and supporting documentation on the status of implementation of measures to eliminate deficiencies in control procedures, the internal control department updates the status of deficiencies in the Monitoring file and prepares reports for the company management on key deficiencies. In the course of updating the status and preparation of the reports, the internal control department, if necessary, in working order, clarifies additional information from the employees of the departments that sent the response to the request and (or) requests additional documentation. The analysis of the replies received and the status update must be completed no later than the last day of the month following the reporting quarter.

Reporting on the status of elimination of deficiencies in control procedures is one of the final stages of the monitoring mechanism for elimination of deficiencies in control procedures.

Based on the analysis of the status of elimination of deficiencies in control procedures, the internal control unit prepares reports for the management of the company:

- a list of key deficiencies that have not been addressed at the end of the reporting quarter and the status of remedial actions;
- list of key deficiencies that were eliminated in the reporting quarter and (or) the level of which was reduced as a result of the implementation of measures in the reporting quarter;
- a list of overdue (not completed in time) measures to eliminate key shortcomings with comments on their non-fulfillment (including the reasons for the delay and actions that are planned to be taken to complete these measures).

Reporting is usually prepared in the format of a presentation, which the head of the department (internal control) sends by e-mail to the management of the company, the heads of structural departments, which are responsible for eliminating key shortcomings of control procedures, as well as to the risk management department and the

internal audit unit. Reporting shall be submitted to management by the set number in the middle of the month following the month of monitoring.

4 Discussion

The problem is the building of an organizational structure in the face of fierce competition on the one hand and a protracted crisis on the other. Perhaps the best approach might be to organize on the basis of the degree of coordination, which implies that workers are grouped according to the degree of coordination required (Basovsky 2013).

The principle of organization in accordance with the requirements of coordination and decentralization through free association, the basis of hierarchical decomposition (Williamson and Winter 2001) and an organizational structure of this kind can be most optimal in conditions of uncertainty.

Non-hierarchical project-based coordination structures and execution teams require a review of the internal control system.

The modern reality becomes achtocracies ("ad hoc"—in relation to the case) exclusively organic and rapidly reconfiguring organizational forms (Mintzberg 2011). The principle of "living organization" implies the existence in the paradigm of "adaptive management," based on the principle of self-organization of biological systems (Meyer and Davis 2007). Virtual networks become modern tools of information and technological coordination. Analyzing the current situation, we can conclude that the rigid control system, which implements one of the main functions of management, is replaced by coordination, the main tools of which will be financial incentives, culture and social control. This kind of change leads to the achievement of coordination through mutual accommodation and such qualities among staff that allow you to quickly and qualitatively switch from one organizational function to another and play several roles at the same time. All this leads to a radical restructuring of administrative functions (Danilin and Slyusarenko 2009).

However, we are far from believing that being on the verge of a new revolution, which includes all the strengths and weaknesses of the computer, we should abandon the already developed and well-established techniques and methods of management. Proven ways of transforming office operations into a strategic advantage can help the company identify losses, ensure efficient use of resources and abilities (Laro 2009).

5 Conclusion

Styles of strategic management in conditions of uncertainty and economic crisis may be absent or very diverse. The economic subject makes a difficult choice between definition and seeded strategy improvement and financial planning. Internal control

provides limitless feedback capabilities, but only under the condition of its rational organization.

Meanwhile, there can be no single scheme for the rationality of the organization of the management system in the current conditions. Common approaches to building an information management system for effective management decisions can be outlined, each organization, based on the conditions in which it is independently determining and improving the mechanism for monitoring the elimination of deficiencies in control procedures, which will result not only in management efficiency, but also in the necessary transformation of the management system itself.

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Features of the Application of IAS 21 "Impact of Exchange Rate Changes"

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Abstract The article is devoted to the research of practical aspects of application of IAS 21 "Influence of exchange rate changes" by companies operating in foreign currency and having foreign divisions. The purpose of the work was to analyze the existing approaches to reflecting transactions, assets and liabilities in foreign currency, exchange rate differences in the consolidated financial statements of companies with foreign divisions with their own functional currency. The procedure of translation of financial statements of Russian companies from functional currency to foreign currency and reporting currency was considered, features of translation of indicators of foreign divisions into functional currency of the company and their presentation in financial statements under IFRS were investigated. The authors proposed approaches to solving the following issues: translation of monetary and non-monetary reporting items of the company into functional currency; translation of reporting indicators in functional currency into reporting currency; financial statements of companies reflect exchange rate differences in foreign currency transactions. The study used modeling of the effect of exchange rate changes on the formation of financial statements of companies. The application of the provisions of IAS 21 standard if it is necessary to recalculate financial reporting indicators into foreign currencies will allow Russian companies to generate the most correct information that will be useful to users to assess its financial situation, taking into

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account the influence of currency factors. At the same time, the reporting organization should further disclose in its accounting policy the methods for converting financial reporting indicators, including those recommended by IFRS.

Keywords Functional currency · Foreign currency · Exchange rate difference · Reporting currency · Financial statements

JEL Classification M41 · F-23 · F31

1 Introduction

Accounting for transactions, assets and liabilities in foreign currency has its own characteristics, which have a significant impact on the formation of financial statements of the company. The question of which currency the IFRS financial statements should be prepared is especially relevant for those reporting companies that operate in foreign markets, have foreign business partners, as well as subsidiaries in other countries.

Each foreign department can have its own functional currency, which will differ from the functional currency of the parent company. If there is such a difference in the functional currencies of the parent (reporting) company and its foreign subsidiary, then when consolidating the reporting, it is necessary to recalculate the reporting data.

2 Methodology

All revenues and expenses, as well as other comprehensive income (including comparative data), must be shown using exchange rates at the transaction date. The IAS 21 standard allows the use of average exchange rates for a period for certain homogeneous situations on the basis of practical feasibility, but if exchange rates fluctuate greatly during the reporting period, the use of average values is impractical (IAS 21 2020).

Scientific works of foreign and domestic specialists in the field of modern accounting and international standards are used as research materials (Borisova et al. 2021; Bushmeleva 2006; Druzhilovskaya and Druzhilovskaya 2015; Ermakova 2016; Karetsky 2013; Kucherov 2013; Nizkov 2019; Kharitonova 2019; Shirikova 2010; Popova 2014).

In Russia, the rules for recording and reflecting transactions, liabilities and assets in foreign currency in financial statements are based on the provisions enshrined in the current legislation in the field of accounting. Companies can generate and submit to interested users accounting (financial) statements in any currency (reporting

currency). In this case, the reporting key figures in the functional currency must be translated in a certain way (Druzhilovskaya and Druzhilovskaya 2015).

As a rule, as a functional currency, the company uses the national currency of the country in which it carries out its main activities. But there are situations when a company operates in one state, and prepares its statements in the national currency of another country (Karetsky 2013).

Using a systematic and integrated approach, when studying the mechanisms for accounting for foreign exchange transactions, collecting and summarizing data, the study used general and special methods of scientific knowledge: monographic, analysis and synthesis, induction and deduction, comparison, as well as the method of summarizing information with the help of which the most important aspects of this study are highlighted.

3 Results

When making financial statements or submitting other financial information, the reporting entity may use a currency other than its functional or reporting currency.

The functional currency is the currency of the environment in which the company operates. In this currency, it estimates the value of its liabilities, assets, income and expenses. The procedure for selecting the functional currency is discussed in IAS 21.

The functional currency is approved by the IFRS accounting policy in the company, and in the notes to the statements the company necessarily discloses the procedure for determining it. All transactions in a currency other than the functional currency are foreign currency transactions and must be translated into the functional currency. Differences that occur when converting from one currency to another are called exchange rate. They are mainly reflected in the profit or loss statement.

For some companies, the analysis of currency selection factors does not lead to an unambiguous conclusion about the functional currency. In this case, it is necessary to determine the preferred activity of the company and give the corresponding criterion more weight. For example, for trading companies, a functional currency can be defined as the currency in which most contracts are made, even if personnel settlements and purchases of goods are made in another currency.

In the case where a company operates in multiple currencies at once, you must analyze and determine which one is functional. The following factors are usually taken into account in this analysis:

(1) in which currency the company's prices are expressed (data can be taken, for example, from price lists, if it is a trading company, or analyze the currencies of main contracts, if it is a contracting company);
(2) what is the national currency of the country in which the company is registered and the country in which it conducts its main activities;

(3) in which currency the company's costs are expressed and carried out (payment of the cost of materials, wages, etc.).

When changing the functional currency, the company applies the translation procedures associated with the new functional currency from the date of the change.

If the official foreign exchange rate of the Central Bank of the Russian Federation is not set, the cross-translation method is used through the currency whose exchange rate is set. For example, the Central Bank of the Russian Federation does not set the conversion rate of the Egyptian pound to the ruble, but information on the quotation of the Egyptian pound against the US dollar is available in information systems (Reuters, Bloomberg, in the Financial Times newspaper), as well as the official exchange rate of the US dollar against the ruble (established by the Central Bank of the Russian Federation). In this case, the exchange rate of "certain currency" to the ruble is calculated through the exchange rate of the US dollar (the official exchange rate of the US dollar at the date of the transaction must be divided by the exchange rate of the US dollar to the "certain" currency "at the date preceding the date of the transaction) (Kucherov 2013).

At each reporting date, assets and liabilities denominated in foreign currency must be recalculated. With this recalculation, it is necessary to distinguish monetary and non-monetary articles. Examples of monetary items are cash, settlement and currency accounts, debt securities, loans and loans.

When applying IAS 21 it is necessary to follow the following basic rules:

1. Transactions in a foreign currency are converted to the functional currency at the rate effective on the transaction date. For transactions of the same type carried out during the reporting period, the average exchange rate for a given period is allowed (in the absence of a significant fluctuation in the exchange rate).
2. Monetary items denominated in foreign currency are translated into functional currency at the closing rate at the end of the reporting period.
3. Non-monetary items denominated in foreign currency at the end of the reporting period are translated into functional currency at the exchange rate at the transaction date (monetary transaction) or at the revaluation date (fair value valuation).
4. Exchange rate difference refers to profit and loss of the period (unless it relates to revaluation relating to other comprehensive income).

If the company purchases fixed assets for foreign currency, the acquisition transaction is converted to functional currency on the date of the transaction in foreign currency. Further valuation (and revaluation) of such fixed asset (non-monetary item) is already carried out in functional currency (Prokopovich 2013).

If you prepay an asset in a foreign currency, the payment transaction is converted to the functional currency at the rate on the payment date. When an asset is taken into account (on the balance sheet), there is no exchange rate difference, since the fair cost of reimbursement for the asset is equal to the amount of payment in foreign currency at the exchange rate on the date of its implementation.

If the asset is accounted for in a foreign entity that maintains foreign currency accounting, the transfer to the functional currency is made at the exchange rate at the

date of acquisition of the asset and at the rate at each revaluation date (if the asset is subject to revaluation).

In the absence of significant exchange rate fluctuations in the reporting period, homogeneous transactions such as the sale of goods (works, services) in foreign currency can be accounted for at the average rate.

Purchasers' receivables (coin item) must be recalculated for each reporting date at the closing rate.

Accounts payable to buyers (obligation) in respect of the outstanding advance are recorded at the rate at the date of receipt of the advance. This obligation does not imply payment of funds in foreign currency and is therefore a non-monetary item.

Prepayment to suppliers for goods, works or services is also a non-monetary item (since it will be closed by receiving goods or services, not foreign currency) and is recorded at the end of the reporting period at the rate at the date of actual payments. Subsequent payment to suppliers for goods, works or services received (obligation to suppliers) is a monetary item and will already be recorded at the closing rate (at the reporting date) (Rybalko 2012).

We will consider the procedure for reflecting transactions expressed in foreign currency, as well as monetary and non-monetary items, using the example of the Russian company ABC, which makes up the financial statements for the reporting year ending September 30, 2020. ABC uses the United States dollar as its functional currency.

ABC sold its own products to a foreign company, HX, in approximately equal instalments each month during the reporting year. Sales revenue for the reporting period amounted to 15,000 thousand euros. The bank account of ABC on September 1, 2020 received a payment from the buyer of HX in the amount of 12,000 thousand euros. The remaining part of the debt in the amount of 3000 thousand euros was credited to the bank account of ABC on October 15, 2020.

On August 1, 2020, ABC made an advance payment to a foreign supplier for materials in the amount of 6750 thousand euros. ABC planned to use these materials evenly over the next five months. On September 1, 2020, ABC received from a foreign supplier the first batch of materials worth 4500 thousand euros and immediately began to use them in the production process. ABC received a second batch of materials worth 1500 thousand euros on October 15, 2020. The following exchange rates were used in the reporting: the average exchange rate for the reporting year was $1.18 per euro; as of August 1, 2020—$1.18 for 1 euro; as of September 1, 2020—$1.19 per euro; as of September 30, 2020—$1.17 per euro; October 15 of the year—$1.18 for 1 euro.

In accordance with IAS 21, sales transactions are considered the same type, and the average currency exchange rate for the reporting period can be applied to them. The company's revenue in functional currency for the reporting year amounted to $ 17,700 thousand (15,000 thousand euros. × 1.18)

Payment from the buyer is considered a one-time transaction and therefore must be recorded at the rate at the date of its execution (on 01.09.20)—14,280 thousand dollars (12,000 thousand euros. × 1.19).

Table 1 Fragment of ABC profit or loss statement for the year ended September 30, 2020

Profits and losses	$'000
Revenue	17,700
Cost of sales	(1062)
Exchange rate difference (negative)	(90)

Source Compiled and built by the authors

The buyer's receivables relate to monetary items, so in the Report on the Financial Position of ABC (Table 2), the amount under trade receivables (negotiable asset) is transferred to the functional currency at the closing rate (in 30.09.20)—3510 thousand dollars ((15,000 thousand euros—12,000 thousand euros) × 1.17).

The resulting negative exchange rate difference refers to profit and loss: $ 90 thousand [($ 17,700 thousand—$ 14,280 thousand)—$ 3510 thousand] (Table 1).

In accordance with the requirements of IAS 21, the purchase of materials and their payment are considered one-time transactions, they must be recorded at the rate at the date of the transaction.

Thus, the advance payment of "ABC" to a foreign supplier for 01.08.20 materials in functional currency amounted to $7965 thousand (6750 thousand euros × 1.18), and the cost of materials received 01.09.20—$5310 thousand (7965 thousand dollars. × 4500 thousand dollars/6750 thousand dollars).

In the statement of financial position of ABC as at 30.09.20 (Table 2), the balance of materials (negotiable asset) in functional amount amounted to $ 4248 ($ 5310). × 4 months/5 months).

The materials used are recognized in the cost of sales of the reporting year if they relate to the sold products. The Profit or Loss Statement (Table 1) of ABC shows the amount of USD 1062 thousand (USD 5310 thousand—USD 4248 thousand).

The balance of settlements with the supplier on the advance payment for materials is a non-monetary item that is taken into account on the date of the transaction (01.08.20).

In the statement of financial position of "ABC" on 30.09.20 (Table 2), prepayment to a foreign supplier (negotiable asset) in functional currency amounted to US $ 2655 (US $ 7965—US $ 5310).

In practice, it is quite problematic to recalculate the income and expenses of foreign divisions at the exchange rate at the date of the transaction, especially for those companies that use automated accounting systems, the functionality of which does not allow to fully implement all the necessary algorithms for the compilation of

Table 2 Snippet of ABC financial statement as of September 30, 2020

Current assets	$'000
Stocks	4248
Trade receivables	3510
Advances issued	2655

Source Compiled and built by the authors

consolidated statements under IFRS. Income and expenditure are therefore translated at the appropriate average rate, unless, of course, exchange rates were subject to significant fluctuations during the reporting period (Postnikova 2012).

Average rate is calculated by simple arithmetic method. MS Excel uploads daily rates during the reporting period and takes their average value for recalculation. At the same time, the most significant transactions can be singled out and recalculated individually at the rate on the date of performance, since recalculation at the average rate can cause too large errors and distort reporting. This applies, for example, to the payment (receipt) of dividends—there may be several such operations in the reporting period and it will not be difficult to track them and recalculate them. The differences arising from the application of different rates to balance sheet items and income (expenditure) are a balancing amount and relate to equity (other total income) "CTR—currency transition reserve."

Equity items are recalculated at historical rates. Differences in this conversion are shown in the capital line "Foreign currency translation effect." The values of changes for the current reporting period are recalculated at the corresponding exchange rates or at its average value, if the error of the latter is insignificant.

The standard does not specify which line of the profit or loss statement should reflect these exchange rate differences: companies make this choice themselves. You can indicate these indicators in the line of other expenses, revealing their structure in the notes, you can—as part of the line "exchange differences," also making a disclosure of what share falls on the translation of currencies of foreign divisions of the company. Another option is to immediately show with a separate line if the amount is significant.

Thus, the most important factor in choosing an information system is its functionality. Currently, add-ons in one form or another have been developed for almost all information systems available on the Russian market. However, the functionality of these software products is not yet comparable to the capabilities of special consolidation systems, which allow you to organize multi-currency accounting and implement all the necessary algorithms to solve tasks when forming consolidated IFRS statements.

4 Conclusion

The research showed that the current Russian accounting standards do not disclose the methodology for recalculating the financial situation and the results of the company's foreign divisions into the reporting currency, as well as the methodology for recalculating the financial statements of the organization into the reporting currency. Application of IAS 21 provisions if it is necessary to recalculate financial statements into foreign currencies will allow Russian companies to generate the most correct information that will be useful to users to assess its financial position and financial result taking into account the influence of currency factors. Therefore, if the financial reporting currency differs from the functional currency, the reporting entity should

further disclose in its accounting policy the reasons for the use of other currencies, methods of translating financial statements, including those recommended by IFRS. If the company changes the functional currency, then the explanations for the statements should disclose the reasons for this fact and give its justification.

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Leguminous Crops in the Food of Russia

Artem V. Lukomets

Abstract Leguminous crops are one of the types of food products in the country's food security fund, which increases the need for more attention to their seed production. Due to the high nutritional value of legumes, the UN General Assembly declared 2016 the International Year of Legumes. In our country, legumes are grown in many regions. The most widespread in human nutrition were peas and lentils rich in protein. The article describes the main characteristics of leguminous crops, their value to humans, the volume of production, trade and consumption by the population and pets, and reflects the place of Russia and other countries in the world production of leguminous crops. In the structure of sown areas, leguminous crops occupy an insignificant specific gravity. In Russia, the main legumes are peas, lentils, beans, chickpeas and lupine. When choosing seeds for sowing legumes, they focus on higher-yielding varieties that ensure an increase in gross product collection. The superiority in the domestic market of imported legumes reduces the competitiveness of domestic producers. The high protein content of leguminous crops increases their value for the production of food and feed for farm animals. Legumes are widely used in the formation of agri-food resources, being an indispensable high-quality concentrated food that contains a lot of protein. In the world production of leguminous crops, peas are in first place, lentils are in second place, beans, etc. In Russia, the production of legumes tends to grow.

Keywords Food supply · Leguminous crops · Seed production · Peas · Lentils · Beans · Yield · Acreage · Gross harvest · Feed

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1 Introduction

The main means of providing the state with a decent level of food supply is at the scientific level organized agricultural production, including the cultivation of legumes, among which peas, lentils, beans, etc. occupy a rightful place. Food products have an advantage over other products. The guaranteed provision of food to the population is the main condition for the activities of any State. The agricultural sector produces food for people, which ensures the freedom of the state in other areas, ensures independence at the global level. One of the important places in food products belongs to the products of legumes. In the economic activity of growing leguminous crops, seed production is of particular interest. In the Doctrine of National Food Security of Russia, an important role is given to increasing the production of leguminous crops. The main producers of legumes are agricultural producers.

2 Materials and Methods

During the research, nationwide scientific methods, the works of domestic scientists on the problems of seed production and the production of leguminous crops, and areas of work to strengthen the food base were used. Statistical and logical analysis methods, statistics on the market for leguminous crops, analysis of the cultivation of leguminous crops in Russia were used.

The conceptual basis of this work was the research and publications of such scientists as Bessonov and Suglobov (2019), Brailova et al. (2020), Zotikov (2020), Soboleva and Belyaeva (2020), Miyuts and Chekalin (2020), Matyuk (2018), Posypanov (2015), Bank et al. (2018), Bessonova et al. (2021), Dudukalova et al. (2020), Kontsevaya et al. (2019, 2015), Nabiyeva (2021), Ryabova et al. (2020), Sekerin et al. (2019) and Shamin et al. (2020).

Authors also used the materials from Agro-industrial complex of Russia in 2018 (Ministry of Agriculture of the Russian Federation 2019) in this study.

3 Results

The role, place and importance of legumes in the formation of food resources has been identified. Possibilities of growth of production of leguminous products are described, place of each leguminous crop in production of protein for food supply is estimated. The development of production of leguminous crops was analyzed, dominant directions of effective use of different types of leguminous crops were identified.

4 Discussion

Agricultural legumes play an important role in ensuring food security and ensuring a rational balanced nutrition of the population. Their production must therefore be sustainable and efficient. In agriculture, it is necessary to expand crops and production of legumes, organize their processing and production of food products. The leguminous direction is considered as promising for the sustainable and progressive development of agri-food products. Legumes are traditionally used by the population in the diet. Despite the fact that the nutritional potential of legumes is sometimes underestimated, and legumes are not always actively consumed. The experience of a number of highly developed countries shows that legumes deserve much more attention, as they play an important role in a healthy diet. Increasing the use of legumes in the food diet of the population increases the level of food security, promotes the development of cooperative and integration relations between producers, processors and consumers of legumes. Enhancing the role of legumes in food production is of strategic importance for the development of national food security activities. Under the conditions of sanctions and embargoes, the need to exchange experience on the cultivation of new promising varieties of leguminous crops is increasing, and to involve representatives of science, farmers, authorities and agricultural holdings operating in the field of food resource formation in increasing the gross production of leguminous crops. It is necessary to increase the promotion of the increased use of legumes in the diet of the population, information on the biodiversity of their connection with the production and processing of agricultural products. The increase in the cultivation of legumes will allow them to take a worthy place in supporting the food supply of various segments of the population. FAO Director-General Jose Grazianuda Silva noted the growing importance of legumes "But one concrete, promising and economically beneficial truth embedded in the smallest seeds of these plants, we know for sure: legumes are the nutritional basis for a sustainable future" (Leguminous Russia 2017).

Since ancient times, legumes such as lentils and peas have been known in Russia, as evidenced by many scientific sources of researchers. The people have such a winged expression "That was a lifetime ago!." The value of legumes lies in their nutritional properties, the benefits of legumes are still in the preservation and improvement of soil fertility. The variety of legumes is very extensive. There are several families of legumes grown in Russia.

Attaching importance to the increase in legumes in the world, UN Secretary-General Ban Ki-moon, in an address to the participants of the 68th session of the UN General Assembly, noted "Legumes can make a significant contribution to solving problems of hunger, malnutrition, environmental problems and improving human health" (Bessonova 2018).

Attaching particular importance to the cultivation of leguminous crops, the main strategic directions and goals were formulated, the main essence of which was to provide the population of the world with wider and better information about the value of legumes, gradually increasing the production of agri-food products, establishing

Table 1 Composition of valuable nutrients in ripe seeds of leguminous crops, as a percentage

Cropper type	Protein	Carbohydrates	Fat	Minerals
Peas	22.9	41.2	1.4	2.7
Lentil	23.5	52.0	1.4	3.2
Chick-pea	19.8	41.2	3.4	2.7
Haricot	21.3	40.1	1.6	4.0
Caper euphorbia	23.0	5.0	1.5	3.2
Lupin yellow	43.9	28.9	5.4	5.1
Lupin white	37.6	35.9	8.8	4.1
Fodder beans	23.0	55.0	2.0	3.1
Vika sown	26.0	29.8	1.7	3.2

Source Leguminous Russia. Food and Agriculture Organization of the United Nations. Moscow, 2017 (Leguminous Russia. 2017)

a balanced and healthy diet for people, increasing the share of legumes in the diet of the population, diversify the food basket to improve the quality of food, ensure supplies to the food market in a wide range of legumes. At the same time, the role of leguminous crops in improving the ecological quality of agricultural products through the use of leguminous crops in improving soil fertility was noted, reducing the use of mineral fertilizers.

Legumes have unique features and are objectively among the most ancient crops cultivated by humans and used for food more than eight thousand years ago. Even in the Old Testament, there are references to lentils soup. Today, legumes are grown in most states of the world on an area of more than 130 million hectares. Currently, about 60 species of legumes are known, among them peas, beans, lentils, lupin, etc. It should be emphasized that among crop crops, legumes have a peculiar characteristic only, having a high protein content in their composition, unlike other cultivated plants, which can be especially useful, including legumes in a human food diet (Table 1).

Leguminous crops have high feed value, increase the efficiency of using other feed in the diet of animals. Raw leguminous protein is used as an ingredient in additives in combined feed, ensures balance of diet by lysine. The value of legumes is still in the ability to bind air nitrogen to nibble bacteria. Legumes are valuable precursors for sowing cereals and other crops, increasing their yields and increasing agri-food production, thereby strengthening the country's food security. Crops of leguminous crops help reduce the cost of acquiring mineral fertilizers.

In the world, the production of legumes has increased over the past 50 years by more than 1.5 times and exceeded 71 million tons. In the sown areas of the world, the share of legumes is about 1.14%. The volume of annual trade in legumes in the world is 13 million tons, with an average annual increase of 5.5%. In the world, consumer demand for legumes is projected to increase. The main exporting countries of legumes are: Canada—28%, Australia—10, Myanmar—10, USA—8, China—6, Russia—5% (Dianov et al. 2018). The share of countries in the world production of

legumes is as follows: India—32%, EU—10, China—8, Bangladesh—5, Pakistan—5, Russia—0.3% (Zotikov et al. 2016).

In Russia, at the beginning of the twentieth century, legumes occupied 1.6 million hectares, the main of which were peas and lentils. At that time, Russia in the world led in the production of lentils, occupied 85% of this crop in world exports. At this stage in Russia, legumes are used both in the food direction and for feed on agricultural animals. Leguminous crops in the country have become widespread in various natural and climatic zones. In Russia, large-seeded leguminous annual crops are grown. Among them are peas, lentils, beans, chickpeas, lupine, etc. From 2000 to 2018 the area of sowing leguminous crops in Russia increased from 920 to 2754 thousand hectares, or almost 3 times. The share of the sown area of legumes in the entire area of sowing crops of the country from 2000 to 2018. increased from 1.1 to 3.5%, or by 2.4 percentage points. During the period under review, the area of pea sowing increased significantly from 584 to 1435 thousand hectares, or almost 2.5 times. The share of pea crops in the total sown area of crops increased from 0.7 to 1.8%, or 1.1 percentage points. In the structure of crops of leguminous crops of Russia, peas occupy the largest specific gravity 63.5% in 2000 and 52.1% in 2018, which is distributed in many regions of our country (Table 2).

In 2018, the gross harvest of legumes in Russia amounted to 2.3 million tons, compared to 1.9 million tons on average for 2009–2013, or 1.8 times more. It should be noted that the production of legumes increased annually compared to the previous year with the exception of 2018. Over the analyzed period, gross production in the

Table 2 Trend of grain crop sowing area structure in Russia (in farms of all categories; thousands of hectares)

Indicators	Years					2018 in % to 2000
	2000	2015	2016	2017	2018	
All crop production area	84,670	78,635	79,312	80,049	79,634	94.1
Crops and legumes	45,585	46,609	47,100	47,705	46,339	101.7
Share in total crop production area, %	53.9	59.3	59.4	59.6	58.2	4.3 п.п.
Including:						
Leguminous	920	1587	1752	2221	2754	299.3
Share in total crop production area, %	1.1	2.0	2.2	2.8	3.5	2.4 п.п.
Of them are peas	584	941	1071	1328	1435	245.7
Share in total crop production area, %	0.7	1.2	1.4	1.7	1.8	1.1 п.п.
Share of peas in crop production area of legumes, %	63.5	59.3	61.1	60.0	52.1	11.4 п.п.

Source Agro-industrial complex of Russia in 2018, Ministry of Agriculture of Russia, 2019

Table 3 Trend of production of grain and leguminous crops in Russia (in farms of all categories)

Indicators	Years					2018 in % to 2000
	2009–2013 annual average	2015	2016	2017	2018	
Gross collection, million tons						
Grain[a]	83.1	104.7	120.7	135.5	113.3	136.3
Including:						
Leguminous	1.9	2.4	2.9	4.3	3.4	178.9
Peas	1.5	1.7	2.2	3.3	2.3	153.3
Yield, c/1 ha						
Grain[a]	20.7	23.7	26.2	29.2	25.4	122.7
Including:						
Leguminous	14.4	15.9	17.5	20.1	13.0	90.3
Peas	2.56	1.8	2.1	2.5	1.6	62.5

Source Agro-industrial complex of Russia in 2018, Ministry of Agriculture of Russia, 2019
[a]In weight after revision

country of peas increased from 1.5 to 2.3 million tons, or 1.5 times. Over the years, the yield of grain and leguminous crops increased from 20.7 to 25.4 centners per hectare of harvested area, or 22.7%. The yield of legumes in 2017 compared to the average for 2009–2413, increased from 14.4 to 20.1 c, or 40%. Pea yields fluctuated significantly over the years (Table 3).

The largest volumes of legumes are produced in the constituent entities of the Russian Federation of the Central, Southern, North Caucasus, Volga and Siberian regions. Agricultural producers of the Stavropol Territory—more than 10%, Rostov Region—more than 7%, Oryol Region—about 6%, Tambov Region—about 6% and Altai Territory—5.9% lead in the production of legumes. Due to the diversity of natural, climatic and economic factors in the country, legume cultivation is located in zones that best meet agricultural requirements.[1]

An analysis of producer price indicators for grain and leguminous crops in Russia shows that in 2018 compared to 2000, average prices of leguminous crops increased from 3365 to 9547 rubles. for 1 ton, or 2.8 times. While for crops and legumes they increased from 2113 to 8516 rubles. per ton, or 4 times. Over the past 2 years, prices have declined compared to the previous year for both crops and legumes (Table 4).

The strategy of increasing the volume of legumes involves supporting their cultivation in the framework of the state program for agricultural development and the regulation of markets for agricultural products, raw materials and food for the coming years. In this direction, a set of measures is being implemented in the country to develop elite seed production of leguminous crops, state lending to the industry, including enterprises processing leguminous crops. The legume industry needs to clearly build a logistics infrastructure to fill the food market with food products from

[1] The atlas of the plants considered at approbation of high-quality crops of grain, leguminous, oil-bearing crops, long-term and annual herbs. Manual. Moscow: Fallow deer 2014.

Table 4 Dynamics of average producer prices for grain and leguminous crops in Russia

Indicators	Years					2018 in % to 2000
	2000	2015	2016	2017	2018	
Average producer prices, annual average; rubles per ton						
Grains and legumes	2113	8684	8923	7451	8516	403.0
of them:						
Leguminous	3365	13,069	16,704	12,275	9547	283.7
Producer price indices, percentage of previous year						
Grains and legumes	180.1	115.2	111.0	92.0	99.1	−88.1
of them:						
Leguminous	151.3	115.5	135.0	99.2	88.3	−63.0

Source Agro-industrial complex of Russia in 2018, Ministry of Agriculture of Russia, 2019

these crops. Due to the adverse climatic conditions in some years due to droughts, the importance of developing risk management mechanisms in the crop industry, regulating the flow of legumes in the infrastructure of the food market to meet the preferred demand of consumers is growing. In assessing the importance of legumes in the provision of food, there is a need to ensure the sustainability of crop producers growing legumes. The Ministry of Agriculture of the Russian Federation planned to increase the gross production of legumes in the country to 3 million tons by 2020 (Godunova 2019).

In the structure of grown legumes in Russia, peas occupy a leading place, which is one of the oldest crops that man began to cultivate independently. In Russia, the cultural production of peas became widespread at the beginning of the eighteenth century. Eating pea products, its taste and benefits received general approval and recognition by humans as a food product. The presence of a large amount of protein in peas brings it closer in nutrition to beef. Pea protein, unlike meat protein, is much easier to absorb by the human body. Leguminous peas, as a valuable nutritional product, have become widespread in many countries of the world. The cultivation of peas is carried out by agricultural producers in almost a hundred countries of the world. More than half of the world's gross peas are produced in three countries: Canada, Russia and China. In Russia, the domestic pea market and the volume of domestic average annual consumption of it tends to grow: 2000–2005—1125 thousand tons, 2008–2010—1064 thousand tons, 2011–2015—1205 thousand tons (Godunova 2019).

Of the legume family, lentils are the most widespread agricultural crop. Lentils have long been widely used as a food crop product in Egypt, India, the countries of the Near and Far East, in ancient Rome and Greece. At the beginning of the twentieth century, Russia acted in the world as the main producer of lentils and its supplier to the world market. Food products from lentils are significantly higher in nutrition and absorption compared to other legumes. In addition, lentil grain is of high value and can be effectively used as a concentrated feed for livestock. Lentil hay in its feeding

qualities is practically not inferior to clover. The green mass of lentil plants can be successfully fed to the main species of farm animals. In the countries of the world, lentils are sown on an area of more than 4 million hectares, the gross collection exceeds 4.1 million tons. Significant sown lentils are available in India, Turkey and Nepal. The average yield of lentils in the world is about 11 c with 1 ha. In some countries it can reach 22 c.[2]

In Russia, lentils are grown in 17 federal districts on an area of about 30 thousand hectares. The annual production of lentils in Russia on average reaches 25 thousand tons with a yield of 8 c from 1 ha. The most significant lentils are produced in the Volga region, Bashkortostan, Tatarstan and in Siberia—Altai Territory (Kosolapov 2016).

A notable popularity among the population of West and Central Asia, North Africa, North America is the leguminous annual chickpeas plant, which is of great importance, except for food qualities, to improve soil quality. The main traditional producers of chickpeas are India, Pakistan, Turkey, other countries of the Middle East, as well as Australia, the USA and Canada. Over 90% of chickpeas are consumed in the States where they are produced (Zotikov et al. 2016).

In Russia, in recent years, there has been an increasing interest in this leguminous culture, and consumer demand for grain and chickpeas has been increasing. Gross annual production of chickpeas in Russia is about 550 thousand tons, the scale of sowing is about 430 thousand hectares. In Russia, the yield of chickpeas varies by year from 30.1 to 42 c from 1 ha. The expansion of chickpea crops and the growth of its commodity production is facilitated by stable export demand for these products. The main producers of chickpeas in our country are agricultural organizations of the Central and Southern regions, as well as Western Siberia.

Beans, a common food in Asian and American countries that are home to the bean crop, have long been in high consumer demand among the population. In America and South Asia, beans have been grown for over six thousand years. Significant beans on field plantations are produced in India, Brazil and Mexico. Residents of Russia have a high demand for beans as a valuable food product. The sown area of beans in our country exceeds 4.5 thousand hectares, and the gross production of beans is almost 7 thousand tons. In the structure of sown areas of Russia, the share of bean crops is 0.006%. The average annual yield of beans in Russia is 17.8 c/1 ha. The demand in the food market for beans reaches 30 thousand tons per year. Three quarters of the demand for beans in the domestic market is met through the import of this product (Godunova 2019).

A valuable crop of legumes is lupin, the seeds of which contain a lot of protein compared to other legumes. Lupin has been cultivated by the population in Mediterranean countries for more than four thousand years. The value of lupin is that, in addition to the usefulness of the products themselves, it is one of the means of increasing the fertility of the soil due to the accumulation of nitrogen in it. Lupine, as a legume crop, has long been widely used as a food product for humans and at the same time used as a feed for livestock. A little later, its useful use property was

[2] See Footnote 1.

revealed as a green fertilizer that improves the quality and fertility of the soil. The first data on the use of lupin in Russia date back to 1811. As green fertilizer, lupin first began to be sown in 1903 (Gataulina 2018).

Lupin seeds, in addition to use in the human food diet and as animal feed, are used as fish feed when breeding trout, sturgeon, etc. The usefulness of lupin seeds is that they contain up to 40% protein. Lupin is a competitive crop compared to other most whimsical agricultural crop crops, as it is able to successfully grow on unsuitable soils. The yield of lupin is 1.5-2 times higher compared to soy, which emphasizes the economic efficiency of its cultivation. The world leader in lupine cultivation is Australia, which has 90% of the world's lupine crops. In Russia, the gross annual production of lupin is about 76 thousand tons, the yield is about 20 c from 1 ha (Gataulina 2018).

5 Conclusion

Legumes with their own specificity occupy a special place in the system of food supply among crops, they supply raw materials from which valuable food products are produced for humans. In Asia and America, legumes are traditionally an important food product. The average annual consumption of legumes in Russia is about 1.9 kg. Moreover, the consumption of legumes by residents of cities is 1.8 kg per year, which is 0, 3 kg less than the consumption of legumes by the rural population. The consumption of legumes is influenced by a number of factors, including the natural and climatic conditions for the cultivation of legumes in places where the population lives, the tradition and ethnic composition of the inhabitants, which affects the formation of food resources in a particular region. In Russia, the production of legumes in the Volga and Southern regions is much more consumed compared to other territories of the country. The value of legumes for human nutrition is also that they are an important source of beneficial food substances. In legumes, the protein content is about 1.5 times higher compared to beef, 2–3 times higher compared to cereals, and 8 times higher compared to milk and potatoes. Legumes from other crop crops are advantageously distinguished by a high level of iron, potassium, calcium, magnesium, vitamins, which emphasizes the importance and need to use products from them in dietary nutrition. It should be emphasized that legumes contain various kinds of biologically active ingredients. The large content of fiber in legumes acts as a reliable source of dietary fiber. The high nutritional value of legumes brings them closer to livestock products and favorably distinguishes them from other crop products. The production of legumes increases their role and importance in ensuring food security in Russia.

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Features of the Legal Regulation of Contractual Relations of Cooperative Organizations in the Context of COVID-19 Pandemic

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Abstract In the context of the COVID-19 pandemic, organizations in various sectors of the economy faced legal uncertainty about the possibility of continuing to comply with civil obligations arising from various treaties. As in the majority of foreign States, the Russian Federation is in the process of seeking optimal measures for the legal regulation of contractual relations under the current conditions. The purpose of this research is to develop an optimal legal model for cooperative organizations to implement contractual relations in the COVID-19 pandemic. By using scientific methods of analysis and synthesis of normative legal acts, adopted by the state authorities of the Russian Federation and the constituent entities of the Russian Federation during the pandemic, The latest jurisprudence in the settlement of disputes of parties to contractual relations related to the impossibility of further fulfillment of obligations and the need for their transformation, as well as working materials of departments of cooperative organizations carrying out contractual work, the author's team obtained the results of the influence of the introduction of restrictive or prohibitive measures by the state during the pandemic on the dynamics of contractual relations of organizations of the cooperative sector of the economy. Since, due to the principle of freedom of contract, a significant amount of legal regulation of counterparty relations can be created by them independently by proactive formation of conditions of contractual

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obligations, the study conducted made it possible to formulate recommendations in the field of organization of contractual work in the context of the spread of a new coronavirus infection.

Keywords Contractual relations · Cooperative organizations · Force majeure circumstances · Termination of contract · Modification of contract · COVID-19

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1 Introduction

The basic principles of the regulation of treaty relations in any developed legal order are the principles of proper fulfillment of obligations undertaken and the impossibility of unilateral renunciation of a treaty. At the same time, in the context of the COVID-19 pandemic, most economic entities faced the impossibility of further proper fulfillment of the terms of civil law transactions as a result of restrictive and prohibitive measures taken by the state to prevent the further spread of coronavirus infection.

The extent of the spread of the disease and the high degree of negative consequences for both the national economy and the and the world economy as a whole, revealed the absence in the legislation of modern states of effective legal regulation mechanisms capable of providing parties to contractual relations with full protection of their rights and property interests in the context of the introduction of mass restrictions on the conduct of business and other activities in order to prevent the creation of threats to the life and health of the population. As noted in modern science, there may well be such a situation that measures to stop the consequences of the pandemic will be more expensive than the direct consequences and losses that economic entities will face in the absence of regulatory measures of the state (Naydenov 2020).

Among the economic entities faced with the need to transform existing mandatory relations, cooperative organizations turned out to be. Since in the Russian Federation there is no single organizational and legal form of a cooperative organization, and the law allows the creation of the latter both in various organizational and legal forms of commercial and non-commercial legal persons, at present there is an objective need for a scientific and practical understanding of the legal mechanisms for optimizing contractual relations of subjects of the cooperative sector of the economy.

The objectives set by the authors are focused primarily on development of recommendations for improving the legislation governing the contractual relations of economic entities and their practice in the activities of cooperative organizations in the COVID-19 pandemic.

2 Methodology

In order to achieve the aim of the study, the following were used as baseline data:

(1) normative legal acts adopted by the state authorities of the Russian Federation and the constituent entities of the Russian Federation aimed at:
   - prevention of further spread of new coronavirus infection of COVID-19;
   - possibility of transformation of contractual obligations in the conditions of active distribution of a pandemic of COVID-19;
   - material and legal support to economic entities engaged in activities in the areas most affected by the pandemic;

(2) the latest judicial practice of resolving disputes of parties to contractual relations, related to the impossibility of further fulfillment of obligations and the need for their transformation;
(3) working materials of departments of cooperative organizations carrying out contractual work.

The analysis and synthesis of these materials made it possible to identify topical problems of legal regulation of contractual relations of cooperative organizations in modern conditions and to develop proposals for their overcoming.

3 Results

The multidimensional activities of modern Russian cooperative organizations imply their entry into various contractual ties. As a result of the monitoring of the implementation of the obligations of cooperatives under the 95 civil treaties studied, which began or continued in 2020, it was found that 38 of them (40%) encountered difficulties in fulfilling obligations due to the introduction of restrictive or prohibitive measures by the state. As a result of the spread of a new coronavirus infection, the most vulnerable, and therefore requiring legal transformation, were the supply, rental and transport agreements concluded by cooperative organizations. The special significance of the latter kind of obligations for the cooperative sector of the economy is indicated in the modern scientific literature (Galochkina et al. 2020).

Overcoming the difficulties encountered through individual legal regulation by amending existing treaties or terminating them by mutual will of the parties has become a priority in the activities of the cooperative organizations under consideration (more than 68%). The key factors that influenced the possibility of reaching an agreement between the parties were the effective organization of the negotiation process and the presence in existing treaties of special legal regulation of the issue of impossibility of fulfillment of obligations. On the contrary, the absence of special rules in the texts of treaties that provide the parties with the possibility of extrajudicial modification of civil obligations, conditions for exemption from liability in

connection with circumstances of an extraordinary nature, predetermined the need to seek judicial protection of rights.

It was established that the approval by the Presidium of the Supreme Court of the Russian Federation of two reviews of judicial practice in the application of legislation in pandemic conditions had a positive impact on the uniformity of approaches to the resolution of court disputes.

4 Conclusion

The general provisions of the civil legislation of the Russian Federation did not allow the formation of an exhaustive regulatory framework for overcoming the consequences of the pandemic in the performance of contractual obligations by economic entities. To exclude possible negative consequences in 2020, public authorities quickly formed the necessary legal framework. At the federal level alone, 855 documents were adopted, 388 of which are normative (Chernogor and Zaloilo 2020). Some studies emphasize the first priority for the State to adopt regulatory measures to regulate rental relations (Latyev 2020). Science also draws attention to the timely adoption of amendments to the Federal Law of December 21, 1994 N 68-FZ "On the Protection of the Population and Territories from Natural and Man-Made Emergencies" (Melnikov 2020). We also note that timely and effective measures were also taken in the field of placing a state (municipal) order, which allowed economic entities, including the cooperative sector of the economy, to avoid the negative property consequences of delay or the impossibility of fulfilling obligations arising from the COVID-19 pandemic.

As a general rule, for participants in contractual relations in the field of entrepreneurial activity, force majeure (insurmountable force) acts as a universal legal means to overcome negative property and other consequences of circumstances such as the rapid development of a new coronavirus infection, which is explicitly indicated in part 3 of Art. 401 of the Civil Code of the Russian Federation. Similar rules are contained in the legislation of foreign countries.

At the same time, from the moment of adoption of the Civil Code of the Russian Federation and until the outbreak of COVID-19, the active practice of implementing such norms in economic relations was either simply absent or was pronounced episodic. In this regard, in scientific work, N. E. Sovenko emphasizes that the concept of force majeure is generally absent at the level of the law. The law is limited only to the signs of force majeure and refers to them as extreme and impossibility to prevent them in the existing conditions (Savenko 2020). An attempt at some specificity was made by the Higher Court of Russia in Order No. 7 of March 24, 2016, however, it provides only general guidelines from which lower courts should proceed when consideration of specific cases.

Due to the principle of freedom of contract, a significant amount of legal regulation of counterparty relations can be created by them independently by proactive

formation of conditions of contractual obligations. In terms of force majeure circumstances, it should be noted that virtually every model treaty of an organization contains a relevant section. Of the 95 civil contracts of consumer cooperation organizations analysed in this study, 83 had relevant sections. However, all sections, without exception, were limited to standard language that did not explicitly interpret the spread of a new coronavirus infection as an exemption from liability for improper performance of obligations.

We believe that there is no need for further justification for the fact that the practice of including general formulations on force majeure circumstances is characteristic not only of the subjects of the cooperative sector of the economy, but also of almost all economic entities as a whole. The absence in modern history of mass precedents of the emergence of force majeure circumstances affecting the entire territory of the state did not connect employees of legal units of organizations with the need for detailed regulation of these issues in the contract.

Summarizing judicial practice, the Presidium of the Supreme Court of the Russian Federation, in two reviews of judicial practice of the application of legislation in pandemic conditions prepared in 2020, expected for the business community, concluded that the coronavirus spreading is not thus a universal circumstance of force majeure. The especially highest court emphasized that it is necessary to proceed from the circumstances of a particular case. As it is rightly noted in modern scientific research, the assessment of a particular circumstance as possessing a sign of emergencies depends on the discretion of the court (Buribaev and Gachina 2020), and in study D. A. Arkhipov justifiably indicates the need for a causal link between it and the default (Arkhipov 2020). We believe that here we are talking not only about the need to take into account the specific conditions for doing business, for example, whether it falls under prohibitions and restrictions, but also the presence or absence of relevant contractual provisions. It should be agreed with the view given in the study by H.V. Idrissov that until this issue is resolved at the federal level, the courts as an argument can take into account the fact fixed in the contract as a circumstance of force majeure, exempting from civil liability (Idrisov 2020).

We also consider it necessary to emphasize that even if the court recognizes the COVID-19 pandemic as a circumstance of force majeure in each particular case, the party to the contractual relationship will be exempted only from liability for failure to fulfill or improper fulfillment of the obligation assumed.

However, in most cases, the interests of protecting the rights of the business entity will be more consistent with the possibility of amending or terminating the contract. The fundamental opportunity to do this in conditions where a mutual agreement cannot be reached follows from the provisions of Art. 451 of the Civil Code of the Russian Federation. But even here we cannot disagree with the validity of the point of view of V. S. Petrishchev, which states that the revision of the terms of the contract due to a significant change in circumstances due to legal nature is not designed for wide and positive application (Petrishchev 2020). Although precedents have begun to form in arbitration practice for a significant (up to 10 times) reduction in the amount of rent, however, the legal basis for such decisions is not the norms of the general part

of the Civil Code of the Russian Federation, but the provisions of special emergency legislation in the field of rental relations.

In the context of the ongoing search for optimal forms of regulatory and legal regulation of contractual relations during the spread of a new coronavirus infection and the formation of a uniform judicial practice for the settlement of disputes, special attention should be paid to the organization of contractual work. In particular, it should be mandatory to:

- provide, in conditions of exemption of the parties from liability for improper fulfillment of obligations, the existence of circumstances caused by the introduction of restrictive or prohibitive measures by public authorities aimed at ensuring the sanitary and epidemiological well-being of the population;
- on the grounds provided by law to initiate the termination of contracts that are clearly burdensome during a pandemic;
- provide for the possibility of unilateral modification or renunciation of contractual obligations in the newly concluded transactions if it is impossible to fulfill them for the reasons given above, to initiate these changes by signing an additional agreement in contracts that continue its effect;
- to make appropriate changes to the internal regulations of the organization for the implementation of contractual work;
- organize the compilation of relevant judicial practice at least once a month, timely communication of relevant information to employees of a cooperative organization.

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Assessment of Economic Prospects of Cooperatives Participation in Private Label Production for Retail Chains

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Abstract One of the latest trends in the development of modern trade is the expansion in the range of chains of goods produced under its own brand. The article presents an assessment of the prospects of participation of production cooperatives in the development and organization of the production of consumer goods for retail chains produced under their own brands. The main purpose of the article is to identify the advantages and problems of concluding cooperation between retailers and cooperators. In the course of the research comparative analysis methods, synthesis, a systematic approach to evaluating data, as well as a dialectical method were used. As a result of the analysis, a list of key advantages and disadvantages in the interaction between production cooperatives and retail chains on the issue of production of products under private brands was formed. Currently, a situation is actively developing on the Private Label goods market in which retail chains are increasingly unable to find a reliable producer. If the selected company is represented by a well-known supplier, then he is not always ready to cooperate with the retailer in the field of private brands. One of the possible exits for retail chains in this situation is cooperation with production cooperatives. Assessing all the advantages and disadvantages of such cooperation, we come to the conclusion that it is promising to establish this interaction and solve problems due to it both from retailers and cooperators.

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JEL Codes D12 · D19 · M39

1 Introduction

The pioneer in a question of creation of own trademarks, undoubtedly, recognized the British company Sainsbury which opened the first shop in 1869. Its founder John James Seynsbury wanted to adjust uninterrupted supply of the shops with goods therefore in 1882 I opened a warehouse in Kentish the Town in a northwest part of London and also constructed in his territory furnaces for production of bacon. Thus, he began to make and sell the first products under a brand of the retail chain stores, and bacon became the first goods of Private Label (Stratienko 2013).

Non-branded goods, them still call generics or patrimonial brands, quickly received popularity in Europe, Canada, the USA, Japan and other countries thanks to low prices. Their characteristic inexpensive packing on which the large print specified the name a product (Steenkamp and Kumar 2015).

In the mid-nineties of the XX century retail chain began to specify the branded name on the goods, and at first it could not coincide with the name of the shop. Emergence of goods-imitators which almost precisely copied the leading brands of producers became the next stage. Gradually some retail chain stores began to start products already under several own trademarks. The quality (Butenina 2014) became a priority by production of honest trademarks.

2 Methodology

In order to identify possible prospects for cooperatives to participate in the production of private label for retail chains, we looked at the experience of domestic retail chain companies, as well as manufacturing enterprises, which are currently suppliers of products of private network brands.

At the first stage, an analysis of the indicators of private label production volumes over the past few years was carried out, showing a steady dynamics of growth in the share of these products in the Russian market (Fig. 1).

Now in large networks positive dynamics of work with private label is observed. Therefore, “Azbuka Vkusa” announced plans of increase in a share of private label in the portfolio up to 30% in the next years, “Pyaterochka” plans to bring a share of own trademarks to 50%, “Perekrestok”—to 25%, “O’Kay”—to 70% and to pass into a format of a rigid diskautner (Mayorova 2017).

According to a study conducted by Reed Exhibitions, the organizer of the exhibition “Own Private Label”, the most interesting among visitors to the exhibition

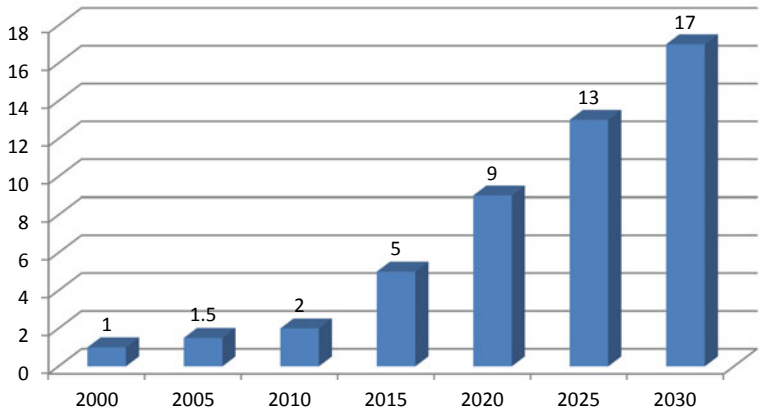

Fig. 1 Private label share forecast in Russia. *Source* Compiled by the author based on forecasts of various experts

are such sections as the production of dairy and meat gastronomy, flour and confectionery products, alcoholic beverages. No less interest was observed in the production of groceries, tea, coffee, soft drinks. Work with private label in the segment of ready-made dishes, dishes of national cuisine, dietary products looks promising.

Most often, goods under their own trademarks are created based on the seller's ability to ensure that the goods have the characteristics that are most in demand among buyers. Such products primarily include food. This is due to a number of reasons, including:

- regular demand;
- availability of standard (most often simple) packaging;
- low dependence of demand on the brand;
- typical product characteristics;
- absence of an innovative component in the product;
- low margin;
- absence of similar products with high loyalty index (Balenko 2010).

The list of the most popular products for production in the form of private label depends not only on the type of products, but also on the country in which the trading network operates. This is due both to the national characteristics of a State and to internal traditions and customs. For example, in Italy, vegetables and various types of paste have a special role to play. At the same time, there are virtually no meat products in the private label assortment, which is explained by the presence of a Mediterranean diet. The opposite situation is developing in the UK, where meat and poultry come first in production and consumption. In Germany, bakery products play a special role in private label products. At the same time, a number of products can be distinguished, which are popular regardless of national characteristics. Among such products are dairy products, juices and water (Koryakin 2008).

3 Results

To date, the practice of Private Label has spread to virtually all categories of goods and services, and their share in sales continues to increase, as well as the very number of categories.

Despite such positive dynamics, at present we can distinguish a number of problems that hinder the development of our own brands in Russia. One of these problems, many experts call the insufficient number of upgraded production capacities, which in turn affects the continuity of the assortment and the quality of goods.

Usually, commercial chains prefer to contact local manufacturers who distribute their products only within the city for cooperation in the production of private label. One of the main requirements for such companies is the presence of stable growth in trade. Starting to work with the retailer in the field of private label production, the local manufacturer gradually enters the regional level, thereby expanding presence in neighboring markets. One of the key prospects of such cooperation may be for the producer to reach the national level, but for this it must prove itself in terms of such indicators as the volume of trade and the quality of products.[1]

It is in fulfilling the latter requirement that it is often difficult to interact with private label manufacturing plants. Most domestic enterprises are not able to fully ensure stable quality and meet the required delivery time. For the retailer, this situation most often turns into discrediting not only the entire private label, but also a decrease in the level of loyalty of buyers to the retail chain itself. In addition, many networks are faced with the need to establish a strict control system, which requires not only significant costs, but also additional administrative resources.

In our opinion, the solution to the problem of finding producers of private label products lies in cooperation with production cooperatives. Thus, for cooperatives, cooperation with trade networks in the field of private label production will be:

- in the growth of production volumes and as a consequence of ensuring the utilization of production capacities;
- there is a guarantee of 100% sale of products in accordance with the contract, under which the retailer undertakes to buy all ordered goods in a timely manner;
- the ability of the cooperative to diversify assortment portfolio without significant costs;
- the possibility of introducing new processing technologies to ensure the supply of necessary goods at the expense of the private label owner;
- to reduce the level of procurement and supply costs, due to an increase in production volumes.
- in the possibility of reaching the federal level.

In addition, cooperators have the opportunity to penetrate new sales markets, since usually, when ordering private label at the enterprise, retail chains stipulate the delivery of goods to all regions where this trademark should be presented. Do

[1] Where do the supermarket's own brands come from? (2019). http://www.the-village.ru/village/business/management/179895-tsena. Accessed 6 Nov 2020.

not forget that along with the release of private label, the cooperative can supply its own brands to the retail network, gaining fame among consumers and expanding the geography of spheres of influence (Kupriyanov 2020). The combination of factors considered will contribute to the development of productive cooperatives in general, and influence the positive dynamics of their financial indicators.

Undoubtedly, cooperation with retail chains will have a number of negative points and "pitfalls". Therefore, choosing contract production, the cooperative receives a lower unit profit compared to if it produced its own successful brands on the same equipment. However, cooperation with the retail chain guarantees that a certain part of the capacity will always be used, despite the success of a particular brand. If the enterprise is not doing very well with its own brands, then sometimes the production of private label for a third-party customer may be the only rescue. Therefore, among the partners of retail chains in private label there are a lot of little-known and not very successful enterprises.

On the other hand, the retailer, concluding a contract with production, wants to expect that with an increase in sales, the supplier will be able to provide increasing volumes. Also, retail chains are trying to limit the manufacturer to price conditions as much as possible. After all, if the latter often raises the purchase price at will, the retailer will lose the possibility of flexible maneuvering at retail prices, which is very important for successful work with private label. Therefore, if the manufacturer in the person of the production cooperative has not calculated everything, then it may be expected by the real "bondage of corruption" (Balenko 2010).

In the relationship between the retailer and the Private Label producer, one of the most pressing issues is the problem of long-term partnership. From the beginning of the development of a private brand to its entry into the market can take six months or more. During this time, the manufacturer invests in production, and he must have a guarantee that, provided he meets all the requirements for the delivery time and quality of goods, he will be able to sell products. However, in Russia, most private label production contracts are designed for one year. At the end of this period, the parties sit down at the negotiating table and renew the contract. However, this still creates excessive tension between partners.

The main reason for the refusal to conclude contractual relations with new counterparties offering private label creation services on the market is their lack of a development strategy. Many new companies do not calculate risks, do not have additional reserves, so necessary in a period of not stable economic situation. After all, if the proposal to create a private label is limited only to this desire, then the chain may have legitimate fears that after the stabilization of the economic situation there will be an absolutely unacceptable reduction in supply volumes.

The specificity of the second reason is not the intensity of the strength of the production capacity of the candidate for the production of private label. This is due to the fact that manufacturers believe that during the performance of work, they will be able to expand production, but in practice it is only an overestimation of capabilities, leading to a negative result.

The third reason is related to price policy, and unfolds even at the stage of creating private label, when the manufacturer offers dumping prices, hoping for their increase

in the process of implementation. This scheme is not acceptable for the retailer, pretending to be its reputation because the obligations made by the chain bear certain guarantees for customers.

The fourth reason lies in the refusal of financial control of the company, namely in the independent examination of financial statements. Many network companies take this procedure seriously and refuse to work with those who do not have or have negative audit opinions (Komadinskaya 2018).[2]

All the reasons considered for the lack of desire of retail chains to cooperate with a particular private label producer do not apply to production cooperatives, the bulk of which have clearly developed strategies for further development, and the duration of existence on the market allows us to talk about flexibility of production and high quality of production activities.

4 Conclusion

The analysis of the development of own brands of retail chains, as well as the assessment of the existing advantages and disadvantages of cooperation in the production of these products for retail, make it possible to conclude that this interaction, in the current conditions of market development, is one of the promising areas for maintaining and increasing production volumes by production cooperatives. The result of such interaction in the near future should be an improvement in the economic condition and the expansion of markets by cooperative organizations of our country.

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Programs for the Development of Priority Areas Within the Framework of National Projects of the Russian Federation

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Abstract The purpose of the research is to analyze the priorities for the development of the national interests of the country, in the context of four national programs. In the process of research comparative analysis methods, synthesis, a systematic approach to evaluating data, as well as a dialectical method were used. The article assesses the development in four areas of national projects: education, science, digitalization of the economy, international cooperation and export, operating in the Russian Federation since 2018. Within the framework of national projects, federal projects and their share in the allocation by the state are determined. The article provides clarifications on the mechanism of implementation of the studied national projects. The main factors were grouped, the implementation of the Digital Economy program for state support and the International Cooperation and Export program presented an analysis of five federal projects aimed at increasing the volume of exports of products. The management of the economic and social process in Russia involves the implementation of a strategic planning system that requires a flexible approach and an integrated selection of institutions and tools for their implementation. In this respect, national projects can be the necessary tools (Ivanov and Byhvald 2019). The work identified and analyzed the most promising areas for highlighting national development interests.

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Keywords National projects · Federal projects · Education · Science · Cooperation · E-economy

JEL Codes I20 · O10 · F01

1 Introduction

In the modern economy, the development of national goals is paramount and important. National projects are tools for achieving results for the national economy and society as a whole. It is worth noting that for the implementation of national projects, the government should allocate significant financial resources that allow them to be financed as a priority. We can also say about the synchronization of project activities with the budget cycle, and the optimization of its elements for their practical applicability (Ezhov 2020).

The article conducted a study, the purpose of which was to analyze the priorities for the development of the national interests of the country, in the context of four national programs.

2 Materials and Methods

The research is based on data from regulatory documents of the Ministry of Education, the Ministry of Education, the Ministry of Communications and the Ministry of Industry and Trade of Russia. For the purpose of analysis, existing national projects were systematized, priority areas "Education," "Science," "Digital Economy," "International Cooperation and Export," which are for Russia a vector of development in the current difficult economic situation both in Russia and in the World.

The theoretical basis of this study was the published works of such scientists as Castle (2020) and Markhaichuk et al. (2019).

3 Results

Optimization of project work related to the development of national goals in the Russian Federation has been carried out more actively since May 2018, according to the Presidential Decree "On National Goals and Strategic Objectives for the Development of the Russian Federation for the Period until 2024." Practical implementation began in 2019 from the moment of the complete formation of the list of national, projects, as well as a plan for their implementation. At this time, the strategic project base has 13 areas, as shown in Table 1.

Table 1 List of national projects operating in Russia

No.	National project	Project implementation period (years)	Amount of financing (billion rubles)
1	Demography	6	3105.2
2	Health care	6	1725.8
3	Education	6	784.5
4	Housing and urban environment	7	1066.2
5	Ecology	7	4041.0
6	Safe and high-quality roads	7	4779.7
7	Productivity and employment support	7	52.1
8	Science	7	636.0
9	Digital economy	7	1634.9
10	Culture	7	113.5
11	Small and medium-sized enterprises and support for individual entrepreneurial initiatives	7	481.5
12	International cooperation and exports	7	956.8
13	Comprehensive upgrade plan and expansion of backbone infrastructure	6	6348.1
Total			25,725.3

Source Compiled by the authors based on Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024"

The main goal laid down in the national project activity is to structure the economy and social sphere of the Russian Federation, problems arising in various sectors of the economy and create a certain base for the further strategic development of the state (Chernenko et al. 2020).

It is worth noting that the most important projects related to the purpose of research are education, science, digitalization of the economy and international cooperation, and export.

Consider each of them separately:

Figure 1 shows the structure of Federal projects within the framework of the National Project "Education," aimed at increasing competitiveness at all three levels of education in Russia (general, vocational, additional). By the end of 2024, the government of the Russian Federation plans to involve about 70% of students in additional general education programs in various forms of support and mentoring (Alterman 2020). For pupils of grades 5–11 of general education institutions, opportunities will be created for individual selection of general education programs, using

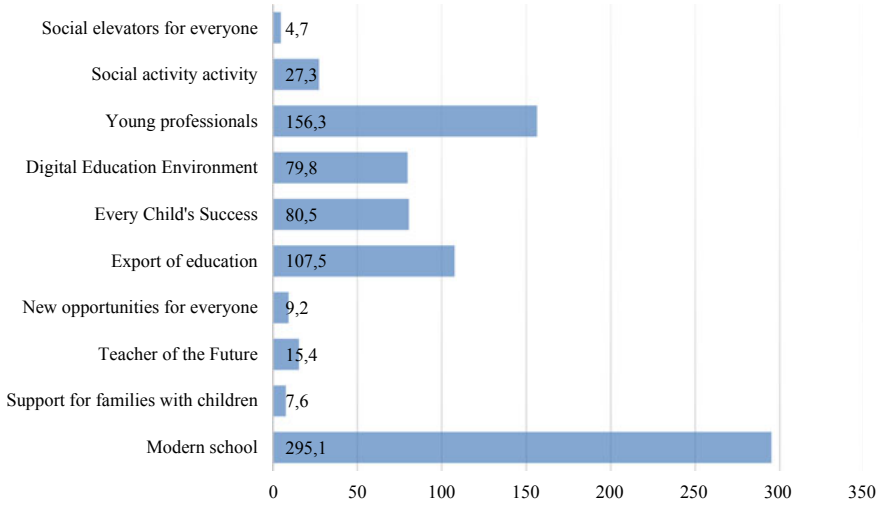

Fig. 1 Structure of federal projects within the framework of N.P. "Education" (billion). *Source* Compiled by the authors based on Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024"

network forms. In order to implement these goals, digital education network "IT clubs" will be created in Russia, in 2019 their number was 20, and by 2024 the planned figure is 340. The number of new schools commissioned is planned to increase by 19.6 thousand by 2024. This measure will create new jobs in general education organizations. In 2020, a national system of teacher growth of pedagogical workers was introduced: teachers under the age of 35 are provided with support and support in the first three years of work, and from 2020 to 2024. An assessment of the quality of general education will be carried out based on the practice of international studies of the quality of training of students in general education organizations of the Russian Federation.

Federal projects that are part of the National Project "Science" include three areas presented in Fig. 2.

To detail the financial component in 2020 of the National Project "Science," we turn to the resolution of 23.09.2020 No. 1533, which indicates the preliminary costs for the construction of two research vessels (NIS) of an unlimited navigation area in the amount of 27.6 billion rubles. This will increase the level of competitiveness of the Russian scientific fleet, both fundamental and applied research. Another important solution is laid down in this project, since the implementation will take place in the far east, this will allow us to talk about additional loading of shipyards.

It should be noted that within N.P. "Nauka" the Universities and the scientific organizations received grants on creation of the engineering centers providing design and computational and analytical services:

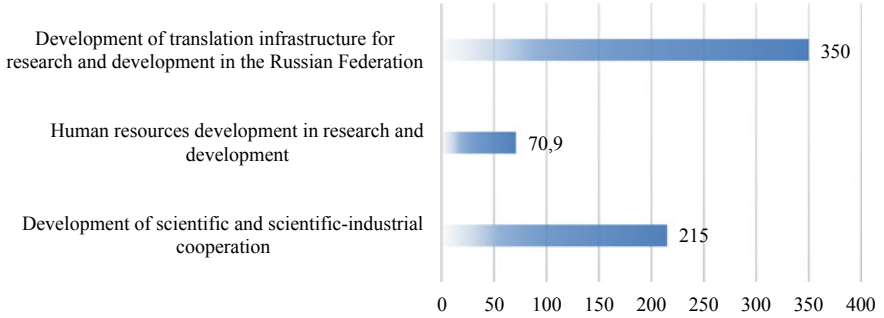

Fig. 2 Structure of Federal projects within the framework of N.P. "Science" (billion). *Source* Compiled by the authors based on Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024"

- "Engineering of the Future" (Samara, Penza, Tambov and Ulyanovsk regions, Republic of Mordovia);
- "Advanced production technologies and materials" (Sverdlovsk, Chelyabinsk and Kurgan regions);
- "Russian Arctic: new materials, technologies and research methods" (Arkhangelsk and Murmansk regions, Nenets Autonomous Region);
- "Eurasian World-Class Scientific and Educational Center" (Bashkortostan);
- "TulaTECH" (Tula region).

Under one agreement, the amount of grants can reach up to 300 million rubles. This support is aimed at the formation of engineering centers working directly with industrial enterprises (Gorchakov 2020; Fig. 3).

Within the framework of the National Project "Digital Economy," the Government of the Russian Federation established costs aimed at developing the digital economy at the expense of all sources in terms of GDP share and, if in 2019 they amounted to 2.2%, then in 2024 it is planned to increase this indicator by 2.9%.

The scheme for the implementation of the National Project "Digital Economy" includes a certain number of rules for the movement of funds from the federal budget for subsidies. This project support is aimed at transforming significant sectors of the economy, and also captures social spheres based on the support of domestic products and domestic manufacturers, services and platform solutions created on the basis of "end-to-end" digital technologies, we provide for preferential lending (Kulagi et al. 2019). The scheme also spells out conditions for legal entities to provide subsidies that have the right to conduct banking operations and provide loans. The Ministry of Digital Development and Mass Communications of the Russian Federation will supplement this scheme and establish requirements for projects in the field of information technology. For residents of the Russian Federation implementing projects in the field of information technology, the state will support in obtaining a loan on

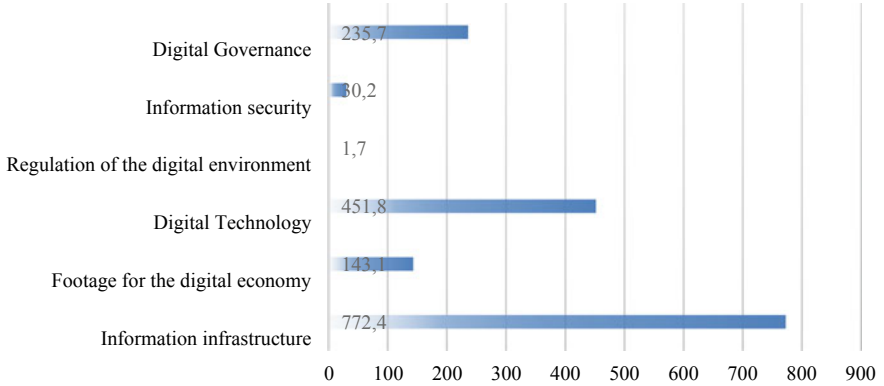

Fig. 3 Structure of federal projects within the framework of N.P. "Digital Economy" (billion). *Source* Compiled by the authors based on Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024"

preferential terms. In this regard, for these purposes, the expenditure item in the federal budget amounted to 3.66 billion rubles in 2020 and 7.02 bn in 202 rub.

The national project "International Cooperation and Export" includes five federal projects (Fig. 4) and aims to increase the volume of exports of products in the following segments of the economy (Charochkina 2020) (Fig. 5):

It should be noted that in order to increase the volume of exports of products, support agreements have been developed, which include a number of competitiveness

Fig. 4 Structure of federal projects within the framework of N.P. "International Cooperation and Export" (billion). *Source* Compiled by the authors based on Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024"

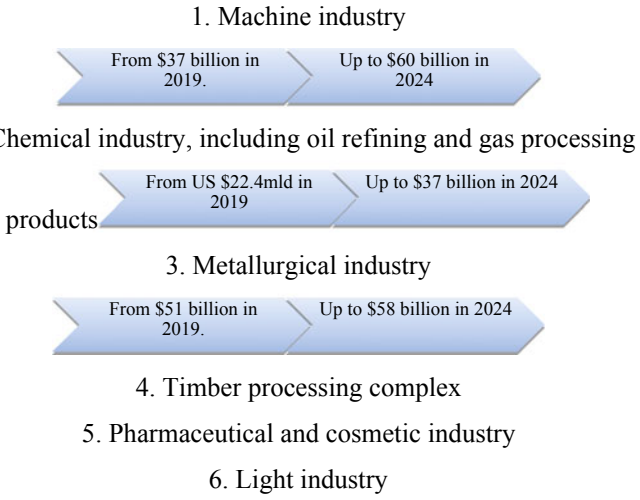

Fig. 5 Structure of the federal project Industrial export. *Source* Compiled by the authors based on Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024"

programs that allow surpassing competitors in the world market. In 2019, according to the government of R.F., the number of programs concluded amounted to 50 of them 10—fish and crustaceans, 10—low-fat products, 14—products of the food processing industry, grain products, etc. The planned figures for 2021 doubled the program data.

Planned indicators for export growth by one ruble of state support by 2024 should be up to 4%.

4 Discussion

The economic and social development of the country is possible on the basis of developed digital solutions, at the state level in Russia this issue has received enough attention. But it is worth noting that for universal digitalization, new digital legal regulatory tools are also needed to solve these issues at the legislative level.

5 Conclusion

Therefore, the national projects discussed above are aimed at implementing state support for the education system, science, the digital economy, international cooperation and exports. Enabling the dynamic development of the national economy and the competitiveness of the state as a whole at the global level. It should be noted that

funding as a whole was evenly distributed among federal and departmental projects, the main source of funding is the federal budget of about 70%, then extra-budgetary 25% and the remaining part of the funds of the budgets of the entities (Edronova 2019).

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Modern Problems of Ensuring the Economic Security of the State

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Abstract The research indicates that ensuring economic security requires modernizing legal policies. Solving the pressing problems of ensuring economic security will allow the state to overcome the process of recession, the severe consequences of financial and economic crises, form other institutions for ensuring national security and create a basis for sustainable economic development. This is especially relevant for modern Russia, when it is in the midst of the development of new legal institutions, when the reform processes in Russia occur simultaneously with the stage of acute socio-economic contradictions that begin with the change of fundamental state-legal mechanisms for managing financial and economic relations. Addressing economic security is multidisciplinary. We need knowledge of the political, economic, social, legal direction. The question of the criminal legal aspect of the protection of economic relations, the criminological direction of preventing actions that undermine the economic security of the country is brought up for discussion by the scientific community.

Keywords Economic security · Threats · Crime · Deviant management activities · Law · Regulation · Responsibility

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1 Introduction

State federal, regional and local strategies and programs for the development of the country's economy, which are implemented in construction, industry, the electric power industry, the system of agricultural enterprises, as well as in social institutions: education, medicine, sports, etc., create new experimental platforms involving the introduction of modern technologies related to informatization, robotization and digitalization of the economy. The strategy for the development of Russian statehood involves improving and updating the forms and methods of work of social, economic, legal institutions to ensure economic security.

Possible internal threats to economic security include the vulnerability of criminal elements to certain sectors of the economy; facts of violation of a single legal space to ensure equal economic development of the regions; lack of comprehensive development of the sectoral structure of the national economy; A certain differentiation between the standard of living and the income of the population.

In addition, the development of economic relations, accompanied by high material and social costs, showed a number of significant shortcomings and omissions on the part of management activities. The existence of fundamental problems in the concept of modernization of the economy does not contribute to its effective development.

The issue of legal responsibility for socially dangerous acts committed by subjects of official and managerial activities in the field of economic relations in this regard becomes very relevant. Taking into account the level of socio-economic development and foreign economic relations, the State has to systematically focus on ensuring the stability of the development of economic relations and their protection from possible threats. In order to improve the effectiveness of economic security, adequate legal regulation of these relations should be considered an important circumstance. Both economics and law are mutually agreed phenomena of public life. These circumstances motivate the analysis of the accumulated scientific basis in terms of the methodology, purpose and objectives of ensuring the economic security of the state.

2 Materials and Methods

The scientific validity and reliability of the basic provisions are confirmed by the use of fundamental scientific works of Russian and foreign scientists in the field of ensuring economic security in the economic, social and legal sciences; a study of the socio-economic and criminological characteristics of modern reality; representativeness of the empirical base of the research.

The conceptual basis of this work was the publication of Kozer (2000).

3 Results

Political stability, economic development and strengthening the country's defense capabilities are the basis for the economic security of the state. Solving the current problems of ensuring economic security will allow the state to overcome the process of recession, the severe consequences of financial and economic crises and create a basis for sustainable economic development. This is especially true for modern Russia, when it is in the midst of the development of new economic structures and legal institutions, when reform processes in Russia occur simultaneously with the stage of acute socio-economic contradictions.

Of course, the solution to the problem of economic security is interdisciplinary. Here you need knowledge of the political, economic, social, legal direction. It will be quite correct to raise the question of the criminal legal aspect of the protection of economic relations, the criminological direction of preventing actions that undermine the economic security of the country.

The reformation carried out in Russia, aimed at establishing a market system of the economy and a rule of law democratic state and rich natural resources ensured a worthy exit of Russia from economic crises and the preservation of the main sectors of the economy. This, of course, is a solid foundation for solving the most important problems of increasing their own economic potential, thereby reviving society, improving the level and quality of life of the population. At the same time, rapid, not always well-thought-out processes of changing the goals and objectives of market reform did not allow the financial and economic system to take a stable form.

State federal, regional and local strategies and programs for the development of the country's economy, which are implemented in construction, industry, electric power, the system of agricultural enterprises, as well as in social institutions: education, medicine, sports, etc., create new experimental platforms that involve the introduction of modern technologies related to informatization, robotization and digitalization of the economy, which contributes to its development and strengthening. In those areas where the risks of private investors are large, budget funds are invested in the country's economy and financial and tax tools are used, since private business is perceived by the state as a real partner in solving the socio-economic problems of public power.

At the same time, the development of economic relations, accompanied by high material and social costs, showed a number of significant shortcomings and omissions on the part of management activities. The existence of fundamental problems in the concept of modernization of the economy does not contribute to its effective development. The exacerbation of socio-economic contradictions complicates the situation in this area (Markelov 2019). A certain dependence of the national economy on the economies of foreign countries creates additional difficulties in implementing the tasks set. The rising trend of mismanagement, mismanagement and corruption in the economy is a direct threat to the economic security of the State (Fedorov 2017).

It should be noted that as a significant characteristic of modern society, the low level of trust of citizens in institutions of power and large business should be

noted. Sociological studies show that the hopes of millions of people associated with dramatic changes in socio-economic life have largely not been realized (Coen 1965). The situation is complicated by the fact that representatives of business management structures and authorities act as malicious violators of economic law and order. They use their official position and authority for criminal enrichment at the expense of the state and law-abiding citizens.

There is an institutional transformation of the ownership system into a shadow economy, which becomes socially dangerous manifestations. Of course, large-scale shadow activity cannot allow economic relations to develop normally and pose a threat to any system of economic security.

In this situation, these and other obstacles that are present in reality and at the level of mass consciousness of the population exert further development of Russian society.

The State, taking into account the present level of socio-economic development and foreign economic relations, has to systematically turn its attention to ensuring the stability of the development of economic relations and their protection from possible threats. Possible internal threats to economic security include the vulnerability of criminal elements to certain sectors of the economy; facts of violation of a single legal space to ensure equal economic development of the regions; lack of comprehensive development of the sectoral structure of the national economy; A certain differentiation between the standard of living and the income of the population.

With regard to management efficiency, it is also important to note that it plays a key role in the development and modernization of the economy. Therefore, the sphere of management of economic relations should not be static, it should constantly be in dialectical unity with the world economic order, while systematically adjusting goals, tasks and methods (Andreev et al. 2018).

In order to improve the effectiveness of economic security, adequate legal regulation of these relations should be considered an important circumstance. It is known that both economics and law are mutually agreed phenomena of public life. Consequently, the legal issues of responsibility for crimes committed by subjects of service and management activities in the field of economic relations should take a worthy place in the system of knowledge of socio-economic reality.

Researchers note that "the downplaying of the role of the institution of legal regulation of socio-economic relations, lobbying for the adoption of individual laws and many other factors acted as fertile grounds for the growth of abuses in the field of economic relations, created the conditions for capital to leave the real economy and its uncontrolled movement abroad, the development of shadow" (Ivanova 2017) entrepreneurial and other economic activities. To date, the resolution of state and social problems in the field of economics has been replaced by interpersonal, clan, administrative and career interests.

In the context of the above, it should be noted that these factors and the significant changes that take place in the Russian economy, including the global economy, are ambiguous. We must agree with the following hypothesis that the sharp increase in economic deviations is primarily associated with the crisis situation in many areas of economic and social life, which in turn is due to the increasing dynamism of social

processes. These circumstances, in turn, produced a variety of forms of criminal behavior in financial and economic relations, including economic crime. Economic abuse is multidimensional and complex. So, according to A. Cohen (A. Cohen), the deviant nature of human behavior is "such behavior that goes against institutionalized expectations, that is, with expectations shared and recognized as legitimate within the social system" (Coen 1965).

It should be noted that economic crime is a dangerous anti-social phenomenon that has no state borders. Economic crime, which was complex, multidimensional and diverse, took on the characteristics of organized international crime. It will not be an exaggeration if we point out that modern economic crime is one of the main obstacles to the implementation of national programmes on social and economic policies. As a determining factor, there have been qualitative changes in economic crime. There is not only a significant addition to the array of crimes committed, but also changes in its basic structural characteristics. These and other circumstances have a significant impact on the pattern of economic crime (Ivanov et al. 2021; Ivanov 2017,2002).

In the context of the above, we note that the combination and interweaving of the interests of criminal-oriented representatives of management in the field of economics and finance led to the formation and strengthening of a separate type of its: official and economic crime. It actively manifests itself and has extended its influence to key sectors of the economy. Official crime "exploits" new democratic forms of life, economic independence of enterprises, new forms of entrepreneurial activity as well as in earlier times it "skillfully" uses the command and bureaucratic system.

Therefore, ensuring economic security is one of the main tasks of any State. It is economic security that should focus on the structure of the formation of Russia's national security. The desire of individual states to encroach on its sovereignty by imposing economic sanctions, establishing "special" rules for conducting foreign economic activity and other negative circumstances increases the relevance of the study of ensuring economic security, as an essential condition for the existence of Russia in general and its partners, in particular.

These circumstances determine the need for a conceptual revision of many provisions that have developed in the Russian state policy of countering economic crime and its varieties. The issues raised in the present study, while presenting a conceptual framework, are primarily of a fundamental nature with an applied focus, which is important for the construction of modern public policies to counter economic crime.

The choice of the right-wing way of influencing this process depends on its nature and extent of distribution. The complex system of the economy, both in the legal sphere and in the shadow sphere, requires an integrated approach to the problems of its legal regulation (Gorodnova et al. 2019).

The above hypothesis is due to the fact that the modern economic development of any state is closely connected with the activities of entrepreneurial, commercial and other structures. Consequently, the State should promote, regulate and protect entrepreneurship from "bad" management and service impact (Gilinsky 2004). And in some cases and in some areas where there are risks of harm to national security, apply strict measures of the law.

In this regard, it is important to note that if there is an appropriate system and it does not cope either at the proper level with the goals and tasks assigned to it, then it seems that it can either be thoroughly subject to fundamental changes, or the so-called small "correction" of its activities is applied. Of course, such changes can be made both in the structure of the system of economic management bodies and in the areas of their functional activities. And if there is no such system of economic management, then, in all likelihood, its creation is expected.

The results of our research confirm "the need for an objective assessment of possible criminal consequences. In addition, taking into account the new conditions, the formation of special measures to protect sectors of the economy from official criminal influence will be required. The need for this is also dictated by the fact that, despite the measures taken, the situation with the criminal use of official position in the country under the influence of continuing negative phenomena, especially in the economy" (Ivanov 2002), remains dangerous.

In the context of the above, it is appropriate to cite the statement of one of the great Chinese philosophers of Meng Tzu, which indicated that if the ruler does not have the principles of justice to conform to his activities, and his subordinates have no laws to keep in the performance of their duties, then at court there will be no trust in the principles of justice, and between the ranks—trust in the laws: the highest will violate duty, and the lower—laws. The preservation of the state under such conditions would be a happy accident (Meng-ji. 1993).

The essence of service-economic crime and its methods of counteracting it can be investigated taking into account and applying philosophical, economic, social and legal categories. This approach will make it possible to specify the universal dialectical method of knowledge and thereby use it in solving specific problems of criminal legal protection of service-economic relations. Without a proper understanding of the nature of management and law, their role and purpose in society, it is difficult to resolve institutional issues of legal regulation. Knowledge of performance, management and law is expressed by theory through its concepts, principles, concepts (Suglobov et al. 2019).

Thus, the problem of the present study is determined by the following scientific and practical considerations.

Firstly, there were qualitative changes in the relations of the state with entrepreneurship, which, we believe, influenced the deepening of market relations, changed views on production methods, entailed changes in legislative and law enforcement activities.

Secondly, the chosen subject of the study is so complex for understanding and research that no, even fundamental work, can cover the interdependence and interdependence of law and economics, the ways of regulating property, financial relations in the field of economics, the substantive essence of mechanisms and institutions of legal protection and protection.

Thirdly, in connection with the emerging world economic crises, an objective need for the presence of the state in the economy was clearly revealed.

Fourthly, since the sphere of business and other economic activities is governed by the principle of permissibility, civil and criminal law occupy their special place, while playing the role of the main core of state regulation and legal protection.

Fifthly, law-making and enforcement activities will inevitably require a solution to the problem of developing the latest theoretical and methodological approaches to understanding the legal possibilities and limits of the legal regulation of economic security activities.

Sixth, the problem chosen for the research is objectively demanded as a result of the evolutionary development of legal mechanisms and their conditionality by economic and socio-cultural factors.

4 Conclusion

Economic security is an independent category. It is distinguished by its own security object, as a system of economic relations. The specificity of security can be expressed in its special goals and objectives, reflecting both the achievement of stability and the dynamic development of the economic system of society, and the level of legal protection of the interests of the entire population in the economic sphere. Economic security should also be given special attention because the threats posed to it were specific. It follows that individual requirements should be imposed on economic security actors.

Acknowledgements The continuation of the research on economic security is seen as more promising for addressing complex problems: theoretical (the creation of a relatively consistent concept of ensuring economic security based on countering economic crime as its immediate threat); legislative (improvement of legal norms); law enforcement (development and adoption of the framework for the implementation of legal mechanisms).

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The Participation of the Constitutional Court of the Russian Federation in the Procedure of the Introduction of Amendments to the Constitution of the Russian Federation: Strengthening National Security Aspects

Svetlana I. Chashchina

Abstract The article explores constitutional lawmaking and the interpretation of amendments to the Constitution of the Russian Federation in the field of ensuring of the national security of Russia by the Constitutional Court of the Russian Federation. The research is based on the General scientific method of system-structural analysis of theoretical materials, methods of technical and legal analysis of the legal position of the constitutional Court and comparative legal differentiation of the consequences of the introduction of a new role function of the Constitutional Court. The results of the research presented in the article show the possible consequences of amendments to the basic Law of the country; concretize the changed legal position of the constitutional Court in connection with the upcoming introduction of new functionality. The participation of the Constitutional Court of the Russian Federation in the procedure of amending the Constitution of the Russian Federation by means of statements of a legal position concerning the preliminary constitutional control in respect of draft laws, which may be represented by the President of the Russian Federation to check, is manifested in a fundamentally new approach to constitutional legitimation of the transfer of some provisions from the law on the Constitution of the Russian Federation. The recognition by the constitutional Court of the Russian Federation of such a procedure as legally significant may also affect the national security of the country, since one of the aspects of the functional purpose of the judicial system is to ensure national security.

Keywords Constitutional Court of the Russian Federation · Interpretation and explanation of the Constitution of the Russian Federation · Law-making · National security · Judicial norm control

JEL codes K16 · K39 · K41

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1 Introduction

To address the problem of ensuring the national security state of Russian country in the contexts of new challenges facing the country, we are forced by modern realities that require not only the prompt response of all public authorities, continuous perfection of current laws, but also the consolidation of efforts of the entire Russian society.

The coronavirus pandemic that originally burst in China and spread around the world has already proved that the more investment the state invests in the evolvement of the social sphere and science, the more it is resistant not only to the spread of new viruses, but also ensures social stability in the country. The stability of the state, thereby, is achieved through the mobilization of its resources, due to the "skillful thereby, is achieved through the mobilization of its resources, due to the proficient implementation of crucial social changes in a right time" (Gnezdilov et al. 2016). According to experts, right now, "this is the time to change the public administration system itself" (RG.RU 2020). Revisions to the basic Law is essential so the change proposed by the Supreme person of the Government is irreversible.

2 Materials and method

To defend the national security of Russia means to create conditions for maintaining security not only momentarily at this time, but also in the prospective future. Having calculated the parameters of the status of personal invulnerability from internal and external subversion, it is possible to determine the state of problematic issues of national security, to find the main reasons that disturb execution of the civil rights and freedom of citizens of the Russian, the deserving quality and living standard. The key role in changing the Russia main document unquestionably belongs to the people. "Superior judicial body of Elemental Law control of the Russian has been assigned the lawfulness to interpret the will of the people by the Elemental Law of the Russian" (Nyati 2008). The judicial body of Elemental Law control that approved changes to the Elemental Law of the Russian, in case of majority of the all-Russian vote, will have the opportunity to Elemental Law contradictions more quickly through preliminary control of a law that has not yet been endorsed by the president of the country.

In preparation for the planned increase in authority of the powers of the highest body of judicial control of the Russian, the subject of judicial interpretation and lawmaking by this body becomes particularly relevant, as the formed framework of Elemental Law regulation in the Russia has not yet used its possible reserves. Developing this idea, we come to resolution that the Superior judicial body of Elemental Law control Russian exercises jurisdiction over public authority, inclusive the key person in the country. Important value of the main law views established by the Superior judicial body Elemental Law control of the Russian in "Conclusion on the Law

on Amendments to the Elemental Law of the Russian" (http://www.consultant.ru/document/cons_doc_LAW_347691/) in the sphere of provision the national security of Russia and its citizens does not raise any doubts. Meanwhile in order to recognize the legal positions proposed by the Superior judicial body of Elemental Law control Russian, an identical understanding of the Elemental Law of the Russian, including the possibility of administration of the international court to protect human rights and freedoms, there should be criteria for distinguishing the official interpretation of legal norms and law-making activities of the judicial control body.

The raised problem of the official interpretation of legal norms and legislative activity of the Superior judicial body of Elemental Law control of the Russian takes one of the first places of legal science. In the context of preparations for the all-Russian vote stipulated by "The Law on Amendment to the Elemental Law of the Russian", this problem gains fundamental emphasis in the context of the democracy principle and the democratic institutions of the state apparatus establishment (http://www.garant.ru/hotlaw/federal/1331750/#ixzz6M97Mj49I).

Based on both the statement above and matter that Superior judicial body of Elemental Law control is the main party of apprehension of the Country's main document, we will consider some theoretical issues that may be considered as a modern methodological basis.

In the specialized literature, one can find various reading of the interpretation of legal norms. Highlighting the variety of options for understanding the interpreted legislative requirement, it is necessary to turn to the conceptual apparatus, which is also used in the scope of activity of the Superior judicial body of Elemental Law control of the Russian. Hence, it is important to refer to the initial theoretical concepts associated with the phenomenon of the evolution of interpretation of legal norms in ancient Rome.

This prerogative, first of all, belonged to the special bodies of Ancient Rome, vested with the right to interpret legal regulations. The legal interpretations of the pontiffs were distinguished by logic, formalism, conscientiousness, and government officials and judges addressed them for comments (Nedilko 2013).

If one can have a glance at the history of the development of juridical lawmaking in the actions of the first body of Elemental Law revision, we would be able to see one of the first decrees of the Superior judicial body of Elemental Law control of the dated 21.09.1993, when the decree of President Yeltsin B. N. No. 1400, provided that the dissolution of the Congress of People's Deputies, the Supreme Council and local councils in the regions, was declared illegal, and the authority of the state head are terminated due to violation of the fundamental law (The President of Russia 1993). The confrontation of the Superior judicial body of Elemental Law control Russian lead to discontinuation of the Superior judicial body of Elemental Law control functionality on October 7, 1993 (TASS 2018). Since then, the Superior judicial body of Elemental Law control has been very "delicate" in responding to requests from the president or deputies. The recollection too deeply buried in the memory of how it all ended in 1993.

If we turn to the theories which determine the practice of explication by the Superior judicial body of Elemental Law control of the Russian of the Basic Law

of the country, we would notice that the Superior judicial body of Elemental Law control of the Russian has to decide exclusively questions of law and not be distracted by clarifying the will of the legislation body. However, the expanse of Elemental Law provisions does not give an unambiguous "recipe suitable for all times and for every case" (Ebzeyev 1998).

Meanwhile, the uncertainty of the interpretation term in the Constitution of the Russian and national legislation does not give reason to doubt that the Superior judicial body of Elemental Law control, interpreting the Basic Law of the country, reveals the meaning of Elemental Law norms, and the result of the interpretation is new awareness about the law ruling, and those that necessarily follow from interpreted statutory requirement. Obviously, the permissible limits of interpretation of sections 1–3 of the Elemental Law of the Russian, if a logical need arises, will be the last statement that can be deduced from the existing norm of the Elemental Law of the Russian by such well-known methods as grammatical, systematic, and historical and others (Kuzakbirdiev et al. 2011).

In this case, it should be highlighted that when clarifying the true meaning and content of Elemental Law requirements, the Superior judicial body of Elemental Law control of the Russian is entitled to easily proceed to include a new specific provision directly in the Elemental Law text, thereby violating the exclusive discretion of the Elemental Law legislator. Thus, the interpretation of the Elemental Law text, leading to the establishment of binding legal provisions that are not deduced from existing legislative requirements, cannot be looked at as an apprehension of legislative norms, but is nothing more than the development of new legal mandatory requirements, i.e. legal making activity.

The standardized relation between apprehension of law and lawmaking of the Superior judicial body of Elemental Law control of the Russian is concentrated on qualitative modifications in the content of acts or their individual provisions (Terblanche 2017). Obviously, the interpretation and lawmaking do not exist without connection with each other. Since the interpretation of the law indicates the specific, complete meaning, content of the interpreted legal norm, the system-forming relationship of the rights, duties and measures of responsibility of the subjects, it can be definitely asserted that legislation of the Superior judicial body of Elemental Law control of the Russian revisions to the functional system of law. Mentioning the assertion of the judge of the Superior judicial body of Elemental Law control of the Russian (Zorkin 2004), the decisions of the Superior judicial body of Elemental Law control of the Russian with the legal positions comprised in them take an essential place in the general system of sources of law, we consider that the lawmaking interpretation of the Superior judicial body of Elemental Law control of the Russian unites the features of an official, competent, professional interpretation with elements of doctrinal interpretation, as a result of which decisions of judicial control authority are issued.

If there are still many debatable problems of interpretation and lawmaking caused by certain worldviews, the legal meaning of the decisions of the Superior judicial body of Elemental Law control of the Russian in legislation and understanding of law is interpreted by experts as the integrity of methodologies and the absence of

choice for them on subjects of managing conflicts between various sources of law at they choose. Decisions of the Superior judicial body of Elemental Law control of the Russian shall be formulated taking into account the findings of legal monitoring, as occurred when developing the Decision of the Superior judicial body of Elemental Law control of the Russian dated 16th March 2020 No. 1-Z toward the Law of the Russian on the amendment to the Elemental Law of the Russian of 14.03.2020 No. 1-FKZ "On improving the regulation of certain issues of the organization and functioning of public authority" (http://www.garant.ru/hotlaw/federal/1331750/#ixzz6M97Mj49I).

It occurs that legislative endeavor of the Superior judicial body of Elemental Law control of the Russian is a population management structure. One of the types of codification process, as we recognize, is the establishment of a precedent by the court. The genesis of law precedents by the Superior judicial body of Elemental Law control of the Russian is executed in the process of making decisions on a specific request. We are deeply convinced that a critical analysis of legislative activity of the Superior judicial body of Elemental Law control of the Russian is significant and timely. E.g.: the Superior judicial body of Elemental Law control of the Russian issued its Opinion on a law that had not entered into force, because the judicial authority would receive the power to consider the Law of amendment of the Superior judicial body of Elemental Law control of the Russian in connection with the procedure of entering into force—All-Russian voting, only as a result of changes to the Elemental Law of the Russian (http://www.consultant.ru/document/cons_doc_LAW_347691/).

This legal position of the Superior judicial body of Elemental Law control of the Russian is extremely interesting to study. First of all, there is an interesting point, which in the text of Article 136 of the present Element Law of Russia puts forward the rule according to which "the amendments enter into force immediately after approval by as minimum as 2/3 of the constituent entities of the Russian." Meanwhile, we can assert that the results of the nationwide voting can only hypothetically change the decision of the legislature, which has already been found to comply with the present Elemental Law in its immutable part. In the meanwhile, the moment under consideration is also interesting because the Superior judicial body of Elemental Law control of the Russian interpreted the direct participation of the people in the all-Russian vote as one of the forms of direct communication of the power of the people and their direct cooperation in the management of state legal affairs.

Noting a new historical moment, namely, the next frontier of strengthening the role of the Superior judicial body of Elemental Law control of the Russian, Elemental Law and judicial normative control seems promising in this sense. Strengthening the role is enshrined in the amendment to section 6th of article 125 of the Elemental Law of the Russian: "Acts or their individual provisions recognized as Elemental Law in the interpretation given by the Superior judicial body of Elemental Law control of the Russian shall not be applied in any other interpretation."

The main challenge, in our point of view, is comprehension of the discretion of the Superior judicial body of Elemental Law control of the Russian in the context of preliminary control in relation to draft laws of different levels that can be submitted for

verification by the Russian President. Today, more than ever, it is becoming increasingly necessary to maintain, "checks and balances" in reference to various departments of government in order to ensure the stability and integrity of the Elemental Law (Kazhlaev 2003). Legislative laws that are not favored by the President of the Russian must undergo a rigorous process of complying with all interpretative rules, as changes "to resolve possible Elemental Law disputes between the Federal Assembly & the President of the Russian" could lead to an extension of the presidential veto (http://www.consultant.ru/document/cons_doc_LAW_347691/). Generally, the President of the Russian would appeal to the Superior judicial body of Elemental Law control of the Russian only if it is imperative to overcome the parliamentary majority. In this regard, more and more often, voices are heard both inside and outside the scientific community that the Superior judicial body of Elemental Law control is actually interfering in the legislative procedure—it is not an after-fact check of the content of the adopted law for compliance with the Elemental Law, but it is built into the work of the presidential power, helping the President essentially implement veto (Newtimes.Ru 2020).

The main thing in this new drafting of the country's main law seems to be that parliamentarians in close cooperation with regional deputies, the business and scientific and expert community, ministries and departments should develop effective measures to improve legislation, since preliminary control of a law not signed by the country's president may block the possibility of a specific normative control—appeal of laws in order to protect the violated rights of citizens. Appeal to the Superior judicial body of Elemental Law control of the Russian after prior control and interpretation of the act received by him will not be possible.

Undoubtedly, the theoretical constructions of the Law on revisions to the Elemental Law of the Russian have a protection assurance effect on the national security system. The role of the Superior judicial body of Elemental Law control of the Russian in connection with the stated topic of protecting national security is expressed in the content of the decision of the Superior judicial body of Elemental Law control of the Russian of March 16, 2020 No. 1-Z on the Elemental Law Amendment Law to the Elemental Law in the following matters (http://www.consultant.ru/document/cons_doc_LAW_347691/).

3 Results

1. The most problematic sector of ensuring national security in our country is an unfavorable state of security in the field of healthcare. It turned out that the safety and the worth of life, organically linked to the corresponding intangible good—the protection of the individual's right to a decent life and free development, takes the second place in the consciousness of citizens of the country (http://www.consultant.ru/document/cons_doc_LAW_347691/). In the new revision of the Elemental Law of the Russian in the case of a new development on the Elemental Law of the country, additional norms on respecting the work of

citizens and ensuring the protection of their rights will appear (http://www.garant.ru/hotlaw/federal/1331750/#ixzz6M97Mj49I). The state will be obligated to guarantee a minimum wage of not less than the cost of living of the able-bodied population in Russia as a whole. In the Russian, a pension system for citizens is being formed on the basis of the principles of versatility, justice and solidarity of generations and its effective functioning is supported, and pensions are indexed at least once a year in the way directed by federal law.

2. The next most important problem is the perception by the Russians of military security through current events almost unequivocally alarming.

Of fundamental importance in connection with the stated topic there is the change to the third part of the Elemental Law of the Russian suggested to a nation-wide vote: "The Russian takes measures to maintain and strengthen international peace and security, ensure peaceful coexistence of states and peoples, and prevent intrusion in the internal affairs of the country." The Superior judicial body of Elemental Law control of the Russian did not consider it necessary to interpret the new legal framework. At the same time, one gets the feeling that Russia unilaterally proclaims itself as a kind of "defender" of the whole world on Earth. In addition, Russia is not an international organization whose main purpose, such as the United Nations, is to ensure peaceful coexistence between countries. After the presentation of changes to the Elemental Law of the Russian, this theoretical construction will be binding on all state authorities in Russia.

3. In the view of future changes to the Elemental Law of the Russian, there is an essential issue of information security in the field of collection, formation, distribution and use of information (Starinov and Tseveleva 2020; Tseveleva et al. 2020). "The interests of a person in the informational sphere lie in the accomplishment of the Elemental Law rights of a person and a citizen to access information, to use information in the interests of carrying out activities not prohibited by law, physical, spiritual and intellectual development, as well as to protect information that ensures personal security" (Fomin 2019).

The government interest in the area of information is to ensure the concentrated interests of the individual in this field, strengthen democracy, developing a legal public state, to attain and maintain social harmony and spiritual renewal of Russia. "The state's interests in the information sphere are to create conditions for the harmonious development of the Russian information infrastructure, the development of public Elemental Law rights and freedoms in gaining information and using it to ensure the devotion to the Elemental Law order, in the unconditional rule of law and order, the development of equal and mutually beneficial international cooperation" (Gritsenko 2017).

4. Legal expediency can be called introducing into the Russia Elemental Law an article about improving living conditions for the citizens.

In fact, actions directed against nature will be declared an Elemental Law. Responsibility for them is brought to a fundamentally different level, the new article says.

At the meanwhile, the application of these principles in the event of a change in the norms of the Elemental Law of the Russian have to be plainly interpreted by the Superior judicial body of Elemental Law control of the Russian for correct comprehension and application by state authorities.

5. Extending our discussion about proposals for the country's Element Law, particularly in amendments to articles 68th & 69th of the Elemental Law of the Russian, which refer to the multinational culture of Russia, we note that legal position of the Superior judicial body of Elemental Law control of the Russian on this issue should be thoroughly tested by representatives of national culture, especially Russian culture, which is a unique heritage of the multinational people and is protected by the state. All this predetermines the importance of Elemental Law and legal certainty of cultural security criteria—the development of culture and education of the population (http://www.consultant.ru/document/cons_doc_LAW_191669/61a97f7ab0f2f3757fe034d11011c763bc2e593f/).
6. In the new edition of part 1 of article 114 of the Elemental Law of the Russian, it is proposed to have modifications in the field of scientific and technological security—ensuring scientific and technological sovereignty.

Additions to Article 114 of the Elemental Law of Russia prepare the country for constant scientific and technological progress. Changes to the Elemental Law of the Russian meet modern realities.

It seems that further work of the Superior judicial body of Elemental Law control of the Russian would provide clear legal guidelines for law enforcement and additional guarantees for the protection of scientific and technological sovereignty.

7. Issues (directions) of law regulation in the sphere of ensuring public security, of course, are subject to assessment by the Superior judicial body of Elemental Law control of the Russian within its capacity. The need for the Superior judicial body of Elemental Law control of the Russian to interpret the updated theoretical position regarding the assignment of public safety to joint jurisdiction of the Russian and the constituent entities of the Russian is obvious. Based on the previously established relevant legal positions of the Superior judicial body of Elemental Law control of the Russian and regulation in this area, it is vital to exclude the existing simplified approach to the Elemental Law vision of public security.
8. Radical Elemental Law reform necessitated a practical solution to religious security in interreligious relations. It appears that the apprehension by the Superior judicial body of Elemental Law control of the Russian of updated article 67.1. Part 2, the Elemental Law of the Russian is a stimulation of the desired legal solution, and not a disclosure of the meaning of the norm or, in another way, jewelry judicial casuistry. In view of the fact that the Superior judicial body of Elemental Law control of the Russian has an independent lawmaking functions, it should be recognized that its decisions acquire a case-law character and become a source of law. At the same time, the Russian Elemental Law authority for the first time stated in its Conclusion to the Law on Amendments that, on

the basis of monitoring the discussion in the information media and internet, also taking into account social significance, it determined those provisions, the assessment of which requires a more detailed, in its opinion, expressions of its position.

4 Conclusion/Recommendations

The analysis has supported the main conclusion that the Superior judicial body of Elemental Law control of the Russian in the procedure of changing the Elemental Law of the Russian concerning the preliminary Elemental Law control concerning draft laws by appeal of the President, is a guarantee of rule of Law in resolving immediate issues as ensuring personal security of citizens, their rights and freedoms, and protection of national interests, safeguard the integrity, stability, functionality of national security of our country.

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Legal Aspects of the Use of Unmanned (Autonomous) Transport within the Framework of the Implementation of Intelligent Transport Systems in the Russian Federation

Olga A. Serova and Aleksandr T. Naniev

Abstract The aim of the study is to identify and define the main legal problems in the regulation of Intellectual transport system. The scale of the research consists in that in the course of its carrying out the analysis of the Russian and international standard legal acts regulating questions of legal regulation of Intellectual transport system is carried out. The problem of absence of legislative base of digitalization of highways, presence of the legal restrictions interfering development of digital economy is raised. The methodological basis of the study was a set of general and private scientific methods, such as methods of legal modeling and forecasting, analysis, structural-functional, dialectical-materialistic, comparative legal, regulatory and logical, system methods. Results of research are revealing and a formulation of the legal restrictions interfering development Intellectual transport system and formation of offers on their elimination. In article questions of legal regulation of Intellectual transport system in the Russian Federation are investigated. For development of Intellectual transport system, maintenance of its high efficiency, fundamental study of the basic steps and approaches to realization of digital transformation of road branch is necessary. It is one of such complexes of actions that are mandatory security measures, including conceptual and normative-technical support; normative-legal support; development of platforms and technologies; development of approaches to formation, including intersectoral and with application of PPP (Electronic paper 2019). The solution of the above tasks requires a systemic approach, combining the knowledge, experience, and resources of public authorities, businesses, research, and public organizations.

Keywords Highway · Transport infrastructure · Intelligent transport system · Unmanned (autonomous) transport

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1 Introduction

The road transport industry is rapidly transitioning to digital technology. Digitalization of transport is becoming a key factor in creating an innovative economy in the Russian Federation. The Russian Federation, with its extensive transport network due to its geographical location, is the world's largest logistics center. In today's economy, digital roads are an essential resource for the country's social and economic development, increasing mobility and social and economic activity. Today, the issue of building a single digital transport platform—Intellectual transport system—is more relevant than ever.

Intelligent transport system is a single ecosystem of interconnected digital services aimed at solving the following tasks:

- traffic management, traffic flows and individual vehicles, as well as highly automated vehicles;
- maintenance and management of road life cycle processes;
- ensuring all kinds of safety in transport systems;
- providing a wide range of information, telecommunication and logistics services to road users and road users.

Of particular importance for the successful development of Intellectual transport system is the improvement of the existing and creation of new road and information and telecommunication infrastructure that provides unmanned (autonomous) vehicles with necessary services and information, as well as improving road safety. One of the strategic tasks outlined in the Decree of the President of the Russian Federation dated 07.05.2018 No. 204 "On National Goals and Strategic Development Tasks of the Russian Federation for the Period until 2024" is to reduce the mortality rate as a result of road accidents by 3.5 times as compared to 2017 and to strive for zero mortality by 2030.

It is impossible to discuss about the development of unmanned (autonomous) transport without the introduction of intelligent transport systems and the development of digital infrastructure, primarily to ensure the effectiveness of traffic management, improve road safety, and improve the consumer properties of roads. Unmanned (autonomous) transport will and must be one of the consumers of highway infrastructure.

The State Company "Avtodor" takes an active part in the development of the ITS, the strategic goal of which is to create and develop a national high-speed road network, attract extra budgetary funding for road projects, introduce innovations at all stages of the life cycle of roads, as well as introduce new tools to manage the development of the road network, as well as manage investment projects, mainly carried out on the principles of public-private partnership, which ensures competition (Electronic paper 2020).

The State Company "Avtodor" has a serious modern experience of projects in the field of Intellectual Transport systems on highways. Most of them are under the auspices of the Automated Traffic Management System. In particular, on M-1 "Belarus", M-3 "Ukraine", M-4 "Don" and M-11 "Moscow—St. Petersburg" highways. Now we are talking about the introduction of Intellectual transport system elements. The most important of them are systems of toll collection on toll roads, as well as systems of meteorological support, monitoring of traffic parameters, and automated lighting control. One of the priority areas of development in the State Company "Avtodor" is the introduction of new technologies in the field of electronic means of payment. The next generation of electronic means of payment is now being actively developed. First of all, it is a Free Flow system that allows you to collect funds without the equipment of special points with barriers.

The development of digital economy at the state level involves solving a number of fundamental tasks in the legal literature in order to create a new regulatory environment that fully provides a favorable legal regime for the emergence and development of digital technologies, as well as for economic activities related to their use (Egorova 2018).

To date, the legislative digitalization of roads in the Russian Federation has been developed only by 5%. On necessity of working out of the legislative base regulating creation of digital economy as a whole and in transport branch, in particular, it is spoken at all levels. The urgency of these issues was pointed out by the President of the Russian Federation in his message to the Federal Assembly of the Russian Federation from «01» March 2018, noting the need to create as soon as possible advanced and flexible legislative framework for the development and widespread use of robotics, artificial intelligence, unmanned vehicles.

Currently, there is an active discussion of the adoption of a federal law on the use of highly automated (unmanned) vehicles, which establishes the basis for legal regulation of relations in the field of unmanned (autonomous) road transport, as well as tax and other benefits for the development of this direction (Vaipan and Egorova 2019). Undoubtedly, consideration of such issues at the legislative level shows the important urgency of development of unmanned (autonomous) transport in the Russian Federation, as there is a special need to form a unified policy, defining the vector of development of a wide range of different structures involved in traffic management on the highways.

2 Materials and methods

At carrying out of research the set of general scientific and private-scientific methods, such as: methods of legal modeling and forecasting, analysis, structural-functional, dialectic-materialistic, system comparative-legal and normative-logic methods was used.

The conducted literary review showed that the problem under study is presented in the works of Vaipan (2017, 2018).

3 Results

Topical issues of legal regulation include the need to update Federal Law No. 257-FZ "On Highways and Road Activities in the Russian Federation and on Amendments to Certain Legislative Acts of the Russian Federation". These requirements should be formulated both in terms of power engineering, telecommunications networks based on wired and wireless data transmission technologies, and in connection with those used for monitoring with hardware and software resources for data processing and storage.

An important role in the development of Intelligent Transport Systems in Russia is played by the organization of info-communication infrastructure on the federal and regional highway networks. Highways are objects of life support for regions and the country as a whole. To ensure the automation of transport management and security on transport, it is necessary to legally fix the requirement to use information and telecommunication systems exclusively of technological and departmental nature, and to use public communication networks commercial info-communication resources to provide non-critical user services.

It is also necessary to actualize the role of roads not only as logistic arteries, but also as information and telecommunication roads. This should ensure the digital connectivity of territories by providing all modern digital services, including user services, info-communication support for emergency services, social and municipal facilities, in areas of highways, and promote the development of telecommunication digital services in remote areas.

All this dictates the need for regulatory support of the issues of intersectoral cooperation in the development and use of technologically digital resources of the highways.

The analysis of the current legislation on highways as elements of transport infrastructure shows that at present the legal system is not ready to fully assume the function of innovation infrastructure formation. The current legislation equates the infrastructure of unmanned (autonomous) transport with any other transport infrastructure. The problem of legal regulation of transport infrastructure objects is not new for the legal science, so the legal definition of the highway, reflected in paragraph 1 of Art. 3 of the Federal Law No. 257-FZ "On Roads and Road Activities in the Russian Federation and on Amendments to Certain Legislative Acts of the Russian Federation" does not connect the signs of the highway with the characteristics of civil rights objects, which is a consequence of numerous disputes arising both in the scientific environment and in law enforcement practice on the issue of assigning the highways to real estate objects and registration of ownership of these objects.

In the case of "smart" highways, carrying out the calculation and analysis of road traffic, monitoring of weather conditions through the use of an automated system of weather support, autonomous control of traffic lights, etc., as well as roads suitable for unmanned (autonomous) transport, which includes many objects of both movable and immovable property, in the absence of proper legal regulation by the legislator, the question of the legal characteristics of this category of object also arises.

The imperfection of the terminological apparatus is one of the main problems in regulating any new technology (Neznamov and Naumov 2018). Currently, the Russian legal field does not have the concept of "highways designed for unmanned (autonomous) transport" or its equivalent, which hinders the development of Intellectual transport system in the Russian Federation. In this regard, a necessary task is set to create a new regulatory environment that would provide a favorable legal regime for the emergence and development of modern Intellectual transport system technologies (Vaipan 2018), in particular, the introduction of the concept of «highways designed for unmanned (autonomous) transport» at the regulatory level, containing the legal characteristics of these objects as real estate objects.

Absence of mandatory technical requirements to design technologies, road construction, and operation for the objects of transport infrastructure of unmanned (autonomous) transport is also one of the factors slowing down the process of Intellectual transport system development in the Russian Federation. Ensuring communication between vehicles and transport infrastructure was identified in the European Union as a priority area for the development and application of specifications and standards (Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport Text with EEA relevance, 2010). The current regulations in the field of design, construction, and operation of roads do not contain any special requirements for roads designed for (unmanned) autonomous transport. Taking into account that "smart" roads, in technical terms, are more complex constructions than roads, it is obviously necessary to approve the list of mandatory technologies for road design, construction, and operation in connection with the implementation of unmanned (unmanned) vehicles.

As part of the development of international cooperation, the issue of interaction between the Russian Federation and foreign countries in the field of Intellectual transport system development and international infrastructure seems to be also relevant. One of the tasks necessary for the formation of a new regulatory environment for the digital economy is to implement a policy on the development of digital economy in the Eurasian Economic Union (EAEC) (Electronic paper 2009). Thus, in the implementation of joint construction of the Russian Federation and the Republic of Kazakhstan transport artery "Silk Road", the infrastructure of the Russian Federation must be compatible and interact with unmanned (autonomous) vehicles running on the territory of the Russian Federation. This task will be facilitated by measures aimed at implementing a coordinated (coordinated) policy with foreign countries in the field of road transport, such as the development and adoption of recommendations on coordinated approaches to the interaction of national intelligent transport systems.

The central element of the Intellectual transport system is the development of unmanned (autonomous) transport. In the Russian Federation as a pilot project defined the highway Kazan—Naberezhnye Chelny, which is preparing for the movement of unmanned vehicles. The pilot project called "Caravan" is considered to be one of the conditions for obtaining the leading position of the Russian motor transport industry in the world (Electronic paper 2018).

The implementation of unmanned (autonomous) transport also requires the state to solve the issues concerning the determination of the legal status of unmanned (autonomous) transport vehicles, autonomous vehicle control systems, ensuring cyber security, protection against hacker and terrorist attacks related to the hacking of intellectual transport systems. To date, there is no complete set of regulatory and technical base. This problem is not only in RussiaTFederation, but also in the whole world. The Ministry of Transport of the Russian Federation is developing a set of measures aimed at ensuring the possibility of testing and phased commissioning of highly automated vehicles on public roads without the presence of a test engineer in the salon.

Modern developments in the field of unmanned vehicles already allow realizing the independent movement of the vehicle on the roads for both commercial and non-commercial purposes (Neznamov 2018). The emergence of unmanned (unmanned) transport raises the question of the need to adjust the legal regulation, as the current legislation does not regulate the integration of artificial intelligence in the management of the vehicle. The analysis of provisions of the current legislation, in particular the Rules of road traffic, doesn't provide possibility of participation in road traffic of vehicles under control of automatic control systems.

At the same time in March 2016 came into force amendments to the Convention on Road Traffic (concluded in Vienna on 08.11.1968), to which the Russian Federation is also a party, which provides for the participation in road traffic of autonomous (unmanned) vehicles, provided that the manufacture, installation and automated system comply with international legal documents (Article 5, paragraph 5 of the Convention), or the possibility of the driver to disable the automated system at any time (paragraph 1, Article 13 of the Convention) (Neznamov 2018).

According to some European experts, as a general rule, the driver should be responsible, except for those situations when the intervention of the autonomous control system could not be cancelled by the driver (Electronic paper 2009).

4 Conclusions

The future belongs to unmanned road transport. There is no doubt about this thesis. But in the conditions of Intellectual transport system development in the Russian Federation, it seems extremely necessary to solve the following issues.

First of all, it is necessary to form a new regulatory environment that would provide a favorable legal regime for the emergence and development of modern Intellectual transport system technologies (Vaipan 2018), in particular, the introduction at the regulatory level of the concept of "highways designed for unmanned (autonomous) transport", containing the legal characteristics of these objects as real estate objects.

Secondly, taking into account the fact that «smart» roads are technically more complex than roads, it is obviously necessary to approve the list of mandatory technologies of road design, construction, as well as operation in connection with the introduction of unmanned (autonomous) vehicles.

Thirdly, the implementation of unmanned (autonomous) transport also requires the state to solve the issues concerning the determination of the legal status of unmanned (autonomous) transport vehicles, autonomous vehicle control systems, ensuring cyber security, protection against hacker and terrorist attacks related to the hacking of intellectual transport systems.

Application of digital technologies, active development of intelligent transport systems in the Russian Federation sets a task for the state to effectively regulate the operation of unmanned and autonomous transport, in which the central issue is the legal regulation of the delegation of authority to manage the vehicle from an individual (driver) to an automated system. As the analysis of provisions of the current legislation shows, at the moment, this delegation is not expected at the normative level.

When considering the issue of normative regulation of unmanned transport, an important aspect is the direct participation of the driver in the driving process; in this regard, it seems important to distinguish between cars with automated driving with the driver's participation and fully automated cars that do not assume the presence of the driver when driving the vehicle.

It seems necessary to provide for a gradual transfer of responsibility for an accident involving an autonomous (unmanned) vehicle from the driver to the manufacturer, taking into account the identified causes of accidents. In the context of the discussion about the legal status of robots and, in general, cars with artificial intelligence, the issue of responsibility distribution seems particularly acute. In the peculiarities of the use of unmanned (unmanned) vehicles, when considering the issue of liability, it is necessary to proceed from the issue of the degree of participation and the scope of the driver's authority in the management of an autonomous (unmanned) vehicle.

- in case when the autonomous control system performs informational and warning function and the driver independently controls the vehicle control, the responsibility in case of damage should rest entirely on the driver, provided that the autonomous control system works properly;
- in case that the automated control system, which is the software for the dynamic control of the vehicle on a permanent basis, which includes all operational and tactical actions in real time and the functions necessary to move the vehicle. These functions include control, side and longitudinal traffic, road monitoring, response to traffic events, and maneuver planning and alarm.

The autonomous control system is able to influence the driving of the vehicle, but at the same time, the control over the driving of the vehicle, as well as the control over the operation of the system is carried out directly by the driver, in case of damage, it is possible to hold the driver accountable for the subsidiarity;

- in case of full autonomous control of the transport means by the system, and impossibility of the transport means driver to prevent an accident, the responsibility for causing damage should be involved either by the developer of artificial intelligence or the seller (manufacturer) of an unmanned (autonomous) transport means.

This division—depending on the degree of autonomy of the vehicle, from the legal point of view is significant. At the same time, taking into account a sufficient number of tragic cases related to the operation of unmanned (autonomous) transport, the introduction of fully autonomous vehicles seems to be difficult.

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State Coercion: Attempt at Interdisciplinary Research

Olga E. Finogentova, Vasilii A. Tokarev, and Mikhail N. Petrenko

Abstract The authors analyze the main approaches of philosophers, sociologists, and law theorists to the definition of the concepts of coercion and state coercion attempting to develop an integrative definition of the concept of state coercion. This concept can be used for finding common grounds between different concepts related to law and state in the vein of interdisciplinary theoretical research. If coercion as a social phenomenon takes the form of state coercion, the concept of state coercion logically connects such phenomena as law and state. Based on the analysis of the concepts of state coercion, the authors identified the structural elements of this notion, which are common to the majority of the considered concepts and therefore can be recognized as universal features of state coercion at this stage of legal science development. The authors concluded that the characteristics of coercion and power indicate the fact that coercion is directly related or is a part of the concept of power (taking into consideration that coercion has an independent attribute not related to power as a whole). At the same time, it means that the content of the concept of coercion, including state coercion, is narrower in comparison with the concept of power.

Keywords Coercion · Power · State · Legal system · Rule of law · Legal subject

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1 Introduction

The definitions of *coercion* as a social phenomenon contained in dictionaries are more consistent compared to the definitions of the concept of power related to it. For example, according to the Merriam-Webster Dictionary, coercion is "the practice of forcing another party to act in an involuntary manner by use of threats or force" (Merriam-Webster Dictionary 2019). Macmillan English Dictionary defines coercion as "the use of force or threats to make someone do something" (Macmillan English Dictionary for Advanced Learners 2002). Lastly, Oxford Advanced Learner's Dictionary defines it as "the actions of making somebody do something that they do not want to do, using force, or threatening to use force" (Hornby 2015).

To compare, the Black's Law Dictionary defines duress (coercion of a legal nature, i.e. state coercion) as "any unlawful threat or coercion used… to induce another to act [or not act] in a manner [they] otherwise would not [or would]" (Black's Law Dictionary 1990).

However, the history of political and legal teachings defines coercion differently. We will analyze the main approaches to determining the notion of coercion, firstly, in the works of leading philosophers and sociologists, and secondly, in the publications of law theorists of the twentieth century. In doing so, our main task is to identify the common structural elements contained in these definitions.

Finally, we will attempt to answer the question about the possibility of developing *integrative definitions* of concepts used in jurisprudence, which is the idea proposed both by supporters and critics of legal positivism (Finnis 2011; Rodriguez-Blanco 2007). We are also developing some of the ideas we have already expressed in our article on the criterion of admissibility of state coercion in modern society (Finogentova et al. 2018).

In our opinion, the discussion of the concept of coercion is in line with numerous attempts to combine different concepts of law aiming at interdisciplinary theoretical research. This concept is in the focus of attention of many philosophers and sociologists, as well as those lawyers who study the legitimacy of laws and state power. Besides, it logically connects such phenomena as the state and positive law, when coercion takes the form of state coercion. In the latter case, its application is subject to tough requirements established by legal procedures and tightly related to both international legal and constitutional provisions on human rights and freedoms.

2 Methodology

The subject of research requires a special methodology, which is used to ensure a more systemic approach to the study of coercion. Methods of other disciplines related to legal science, for instance, philosophy and sociology are particularly relevant to the study. The dialectical method and methods of formal logic used by several researchers allowed them to identify the main characteristic features (attributes) and systemic

connections of state coercion (Hughes 2013; Lamond 2001; Leiser 2008; Raponi 2015).

Besides, this interdisciplinary approach makes it possible to determine the place of coercion among other ways of exercising state authority (Schauer 2014; Stavropoulos 2009).

We consider it important to explore the concept of coercion from a sociological point of view and study it as a social phenomenon. The social aspect of coercion is particularly obvious when coercion takes the form of public enforcement (Arneson 2003; Wollner 2011).

We analyzed a considerable body of literature and explored the concept of coercion in the works of Kant (Korkunov 1922), Hegel (2001), Durkheim (1974), Weber (1968), von Hayek (1960), and other philosophers while studying the evolution of socio-political thought in the eighteenth to twentieth centuries. At the same time, we followed the ongoing debate between positivists and their opponents. This discussion often goes beyond the narrow framework of legal science; therefore, we decided to turn to the works of Finnis (2011), Kelsen (1967), Korkunov (1922), and Lloyd (1991).

3 Results

When analyzing the phenomenon of coercion, Immanuel Kant considers the situation when exercising individual freedom as a serious obstacle to achieving freedom, consistent with universal laws. In this case, according to the German philosopher, coercion directed against individual freedom is comparable with the freedom consistent with universal laws. Thus, coercion applied to the individual, who by his action or inaction breaks the law is legal in nature. According to Kant, the law should be ensured by external coercion by individuals or by the state (Kant 1998).

In recognizing the need for coercion, Hegel interprets it as a subordination of the individual (consequently, his behavior) to the power of other people. However, he emphasizes that only someone who wants to be forced (coerced) can be forced (Hegel 2001). Developing this idea further, one can come to the understanding of coercion as the ability of the subject to ensure the object's subordination by the threat of punishment in case of disobedience. At the same time, coercion can be replaced by other types of influence if the object refuses to obey and perform the actions required. These forms of influence include force or manipulation.

The French sociologist Durkheim stresses that coercion owes its origin to the fact that the individual may worship the force he faces. This force dominates over him. It exists naturally. It does not come from a contractual agreement arranged by the individual, but from the innermost part of objective reality and, therefore, it is a logical result of the causes, which are embedded in it. According to E. Durkheim, there is no need to resort to any tricks to force an individual to obey. It is enough to simply identify the object of coercion, his weaknesses, and make sure he is ready to surrender to forces beyond his control. On this basis, either a sensory interpretation

of coercion or a specific concept of coercion is formed. The former is religion and the latter is science (Durkheim 1974).

In his analysis of the phenomenon of power, Max Weber emphasizes its legitimacy and legality. He writes that coercion requires a special group of individuals who perform this function. These are not necessarily government officials, bailiffs, prosecutors, i.e. people who ensure obedience. However, if a law is broken, it is they who ensure law enforcement. Max Weber believes that a family or a clan can become such a group if a member of a family or a clan does not follow the rules adopted in it. A religious community can also perform the function of coercion, for instance when a senior member, "a brother in faith" warns an individual who has departed from the rules and canons of the community about such inappropriate behavior (Weber 1968).

The economist and philosopher Hayek defines coercion as managing and controlling the social environment of the individual in such a way that, to avoid negative consequences, he is forced to act not by his plans but according to the plan imposed by another person and serving the person's goals. From this point of view, the use of force or even violence is an important but not the only form of coercion. This interpretation of coercion leads to the necessity to include not only the physical force but also non-violent actions in the definition of coercion. If a wife is constantly nagging at her husband to achieve her goal, it is a non-violent type of coercion and the husband can always leave the grumpy spouse. Hayek concludes free society delegates the monopoly on coercion in public matters to the state to limit arbitrariness on the part of individuals (Hayek 1960).

The definition, essence, and structural attributes of coercion are reflected in legal science as well. However, in this context coercion is mainly discussed in one of its forms—state coercion. Legal science studies the phenomenon of state coercion as such, as well as its legal justification and limitations.

We propose the term *legal state coercion* as the most acceptable from the point of view of the nature of the phenomenon considered—exercising state power through law. This term reflects the essence of state coercion, namely, the fact that it is regulated by law. More precisely, state coercion is expressed in legal norms and included in the state system of law. It is noteworthy that many scholars, especially those adhering to the classical terminology of legal science have not recognized this definition of the term yet.

At the same time, it is generally accepted that there is a difference between state coercion and state power in the form of coercion. It is the role that the government performs in the act of coercion. State coercion is an act committed by competent governmental bodies and authorities based on legislation. There is no doubt that state coercion cannot and must not be used to pursue the private interests of individuals.

Nikolai Korkunov recognizes the priority of the state among various forms of human communication. In his opinion, the state is an independent social body, which assigned the right to exercises control over free people to itself (Korkunov 1922). Consequently, this social body acts to implement the right. We would like to stress that Korkunov considers it to be misleading to define the concept of state exclusively through its functions and goals. Instead, it is necessary to identify the attributes that are inherent in all states, i.e. universal structural elements of this concept. Korkunov

defines power as a fundamental attribute of any state. At the same time, he does not recognize sovereignty as an attribute of state power, because it is understood as an unconditional and unlimited power. He believes that this kind of power simply does not exist. The power of each state is limited and influenced by outside forces. At the same time, it is the only means of exercising coercion in society, and individuals and public bodies are allowed to exercise coercion only to the extent established and controlled by the state. Thus, according to Korkunov, the main characteristic inherent in any state is a monopoly on coercion.

In our opinion, there are two provisions in this interpretation of state coercion that are of particular interest.

Firstly, this interpretation contradicts the paradigm that explains the nature of power from the point of view of "single will". A single will can only be expressed and implemented by an individual. The state lacks the main attribute of personality—individual consciousness. Therefore, in reality, state power cannot be expressed or take the form of some single will that dominates over people. Rather, state power is a constant struggle of many opposing wills.

Secondly, the authority of the government is ensured not by the physical force of governmental bodies, but by the recognition of the obligatory character of such will by society members. In other words, domination as a social phenomenon presupposes consciousness not on the active side, that of the dominator, but on the passive side, that of the dominated. The latter are aware of their dependence on the will of the dominating subject.

A more abstract category for the generic category of power as state coercion (a generic category for a generic category) is the category of power. Since society represented the state and its bodies support the ruling person in both cases, the above statement means that the concept of power as state coercion fully inherits the characteristics of the concept of state power. This idea has been clearly articulated, albeit in a simplified form, by the English lawyer Dennis Lloyd. He writes that the notion of power suggests entitling a person to demand obedience from other citizens, regardless of whether they are willing to consider this particular norm or rule acceptable or desirable (Lloyd 1991). At the same time, Lloyd makes an important reservation that the person vested with the power to bring others under control is not necessarily an individual, for example, an absolute monarch.

In his *Pure Theory of Law*, Hans Kelsen goes even further and postulates that law and state are different sides of the same phenomenon (Kelsen 1967). He believes that the state is the persons and bodies, whose actions or failures to act are legally qualified as legal acts. Only the acts of these persons and bodies are legally attributed to the state through legal norms. Therefore, they are recognized as acts of the state. By their simple facticity, any other actions carried out by officials are personal actions of individuals holding public office. Within this logic, the state is a centralized legal order, whose bodies can function only by creating, enforcing, and observing legal norms. A legal state is an institution that is based on law that enforces the law, and monopolizes the function of organized coercion in society. A question arises as to whether this means that Kelsen has created the foundations of a volitional theory

of the state holding that the institution in question is a personification of normative order and it has to rely on its acts since norms are the essence of volitional acts.

Kelsen's answer to the above question is negative. He argues that the state is not a real, factual phenomenon and it does not have a will. Moreover, the state as a "mental image" is not a fact of the natural order; it cannot be found in the world of natural, psychological, causally defined objects without a connection to the system of norms, the reality of which should be postulated. The state, from the standpoint of normativism, is a fiction of legal thinking, or rather, its function used to justify the unity of the legal order; it is not a real being with its own will and power.

According to Kelsen, the behavioral acts committed by persons who represent the state are attributed to the state, which is the centralized legal authority ("central imputation"). The state is not an actual socio-political union of people. Therefore, the statement that the content of legal order is a volitional act of the state is a mere metaphor for normativism. This metaphor, however, is of great practical importance as an effective explanatory scheme: when interpreted this way, the concept of the state contains a point of imputation that makes it possible to designate the acts connected with it as legal ones (Somek 2006).

Finally, advocates of natural law theory focus on such an essential feature of state coercion as its compliance with the requirements of rationality and justice. Finnis believes that punitive sanctions should seek to restore reasonable personality in offenders, reforming them so that they can "lead a good and useful life" (Finogentova et al. 2018). By intention, recklessness, or negligence, a criminal act against the common way-of-action, which Finnish calls "the rational order of proportionate equality, or fairness". The essence of this order is that public authority gives preference to common good over the selfishness and voluntarism of an individual. At the same time, however, the state recognizes the autonomy of the individual as a good. By punishing criminals, the state deprives them of what they have acquired by committing a criminal act—the exercise of will and free choice.

Philosophers, sociologists, and legal scholars have proposed a range of approaches to defining coercion. These approaches can be divided into three groups. The first one includes the concepts whose authors see the goal of coercion in ensuring security and providing protection (Kant 1998).

The second group brings together the approaches whose advocates define the goal of coercion as ensuring that an individual behaves in a way that is beneficial for society (Finnis 2011; Lloyd 1991; Weber 1968).

The third group consists of approaches, according to which the goals of coercion are identical to those of the coercing an individual (Kelsen 1967).

Of course, some approaches to understanding the goal of coercion do not fit into the above classification. For Hayek, the goal of coercion is to avoid a greater evil, whereas many researchers, both classical and modern, leave the question of the goal of coercion open and do not examine it in their works.

As noted above, in a common understanding, coercion is not limited to protecting something from something, to ensuring that an individual behaves for the benefit of society, or to any other predetermined goal. Examining a common understanding of coercion, i.e. compelling someone to do something, leads us to conclude that since

the coercing person influences the coerced person to make the latter perform a certain action, the coercing person determines the actions to be performed by the coerced and ensures such performance. Therefore, only the coercing person establishes and determines the goal of coercion.

The goals of coercion are identical to those of the coercing person. His or her goal, however, can be the protection by the coercing person of his or her rights of the rights of another; the protection of himself or herself of another person from extern interventions; or ensuring the socially necessary behavior in the coerced or any other person. The concepts of coercion attributed to the first and second groups are fair, yet they do not cover the whole range of possible goals of coercion.

4 Conclusion

The above interdisciplinary study of the structure of coercion leads us to several important conclusions.

Most researchers identify the following structural elements of coercion as a social phenomenon: (a) the goal of coercion, which is the actions of the coerced person in the interests of the coercing person; (b) the object of coercion, which is the will of the coerced person; (c) the resources used by the coercing person; (d) coercion as a result of differences in the purposes of participants in power relations; (e) the social nature of power relations.

A comparison of the above properties of coercion as a social phenomenon with the traditional characteristics of public authority proves their identity. However, alongside the above properties of coercion that are identical to those of authority, researchers identify characteristics that are unique to coercion. These include the capacity of the coerced person to choose a pattern of behavior (Berman 2013). In turn, this capacity is an effective criterion for distinguishing public political authority in the form of coercion from that in the form of power.

The choice of a pattern of behavior by the coerced person and his or her subsequent decisions are implied by conduct, i.e. they are expressed in objective reality. Therefore, when exercising public political power in the form of coercion, the following dilemma occurs: the coerced person either yields to the demands of the coercing person (according to Hegel, such demands can relate only to the external element of human nature, which is expressed in objective reality (Hegel 2001) or he or she does not.

Thus, a common understanding of coercion suggests that coercion is the performance by the coerced of such actions, the results of which meet the interests of the coercing persons and do not meet the interests of the coerced. Independent actions of the coerced person are in interests of the coercing person. The actions of the coerced person are of fundamental importance to the coercing person. The feedback that the coercing person receives consists in whether his or her demands are satisfied or ignored by the coerced. Based on this feedback, the coercing person calibrates his

or her influence by increasing or decreasing its intensity or by altering the resource used to attain his or her goals.

At the same time, the choice is an internal element of human existence and, according to Hegel; it cannot be imposed from outside (Hegel 2001). Consequently, the choice will take place when public political authority is exercised both as coercion and as power. In the latter case, the role of the subordinate as an independent person is minimized.

We do not support the perspective that the coerced person should maintain the capacity to choose a mode of behavior. There is a need for a criterion that can distinguish coercion from related phenomena, for a property that makes independent behavior of the coerced person significant for the coercing person. In considering state coercion as the perfect form of coercion, we see it as a form of public political authority, in which the behavior of the coerced person has significance for the coercing person. Moreover, the identity of characteristics of coercion and power (whereas coercion has a distinguishing feature that does not apply to power in general) means that coercion is an instance of power. Another proof is that the concept of coercion (and public coercion) has a narrower meaning than that of power does.

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Trends in the Development of Public-Private Partnerships on the Example of the Social Sector of Moscow

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Abstract This study focuses on legislative regulation of public-private partnerships, its development, and implementation mechanisms in the socio-economic sector. To analyze the partnership of business and government in the infrastructure sectors, we reviewed the experience of similar projects in the social sector on the example of the city of Moscow. The authors have analyzed the legal framework of municipal public-private partnership (PPP), identified several legal problems, and examined the development prospects of PPP in the Russian regions (especially the federal projects in the social sector). As a result, the authors proposed several recommendations on the development of PPP in different Russian regions that are based on the rich experience of PPP in Moscow. The authors conclude that PPP in Russia is an effective tool for implementing federal projects, which allows reducing the budgetary burden and encouraging private enterprises to take innovative approaches in solving long-term social problems.

Keywords Public-private partnership · Municipal public-private partnership · Social sector · Development trends · National projects · Concession agreements · Budget legislation · Federal law No. 224-FZ · Infrastructure · Transport hubs · Subsidies · Government of Moscow · Urban development policy · Social development strategy of Moscow

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1 Introduction

The efficient functioning of the social sector, its regular renovation, and the use of innovations are one of the most fundamental elements of economic development in any country. In Russia, the issue of social development is extremely important since the last 15 years saw little to no investment into social infrastructure. The lack of federal financing does not allow for efficient social policies, while the existing legal framework does nothing to protect potential investors into capital-intensive social projects. Moreover, municipal and local governments are unwilling to cooperate with private investors and transfer authority in the field of social infrastructure.

Public-private partnership (PPP) is entrusted with serious tasks since the experience of foreign countries shows the positive effect of interaction between the state, the society, businesses, and private investors (Gromova 2018; Maslova 2019). In the UK, Canada, and European countries, there are effective legislative systems that promote the active use of PPP. Most of the PPP projects focus on the construction of highways, bridges, tunnels, and intercity highways (Fadyushin 2019). Moreover, the average costs of PPP projects tend to increase annually (Sergunina 2020). Additionally, the number and the diversity of PPP projects increase with the development of its legal framework. The existence of a legislative foundation transforms the institution of PPP into an effective and widely-applied tool.

Currently, PPPs in Russia are regulated by Federal law No. 224-FZ (Russian Federation 2015). This document enshrines the basic concepts, rights, and obligations of parties to PPPs. Further development of legislation led to widespread use of PPP mechanisms in many Russian regions and various socio-economic sectors: from multimillion projects for building sports and recreation centers in the Republic of Tatarstan and the Elegest-Kyzyl-Kuragino rail line to small-scale deals of 60 thou. RUB in the Republic of Bashkortostan. However, several legal gaps limit the use of PPP, especially in the social sector (Kabanova 2018). This problem is successfully being solved in some regions of Russia. The authors of this study intend to demonstrate the development of PPP on the example of the social sector in Moscow.

This study aims to analyze the legal regulation of PPP, its basic principles, and development mechanisms. Moreover, the study presents PPP as an effective tool for the socio-economic development of a country. The study aims to analyze how PPP is currently implemented in Russia and examine the regional specifics of PPP implementation.

The development of PPP is a subject of many scholarly studies. For example, the works of V. V. Avekov, K. I. Alekseev, A. M. Belyaev, V. G. Varnavsky, A. G. Zeldner, and M. E. Konovalov dwell on the theoretical foundations of PPP as a notion, as well as the problems and benefits of such projects. Other scholars, such as A. A. Almpatova, V. G. Varnavsky, M. B. Gerard, L. I. Efimova, and A. V. Runova, focused on the practical experience of PPP implementation. However, the issue of PPP lacks complex studies that tie it to the social sector. Moreover, no works on the topic considered the practical implementation of PPP in the social sector of Russian regions, accounting for the latest trends in PPP development.

2 Materials and Methods

In this study, the authors applied several research methods: systemic method; comparative method; structural-functional method; generalization; analytical method; and induction. The systemic method was used to examine the current regulations of PPPs in Russia (Egorov and Minina 2018).

The comparative method was used to analyze the condition of PPP in different regions of Russia.

The mechanisms of PPP were analyzed via the structural-functional method and classification method. The former allowed the authors to identify the problems and trends of PPP, while the latter permitted to closely examine the experience of Moscow from the economic, social, and public perspectives.

The literature review was conducted using the generalization method. This allowed the authors to consider many factors of PPP as a whole.

The analytical method and induction were used to briefly summarize and provide conclusions for each aspect of the topic.

3 Results

In this study, the authors analyzed the specific features, main forms, and implementation mechanisms of PPP in Russia. Building upon that, the study examines the use of PPP in social infrastructure, namely the development trends of PPP in the socio-economic sector and the implementation of PPP social projects in Moscow.

The adoption of the Federal law "On Public-Private Partnership, Municipal Public-Private Partnership in the Russian Federation" (Russian Federation 2015) was a necessary step to the development of PPP in Russia since it regulated the interaction of the government and private investors in a complex way. However, this legal provision as amended several times since its adoption in 2015, which can be explained by the development of the PPP institute, changes in market structure, and shifts in the political and economic environment (Isaev 2020).

The "Rating of the PPP development in the Russian regions" is an especially interesting tool for this study since it allows to assess and evaluate the state, development, and use of PPP in various constituent entities of the Russian Federation (Moscow Investment Portal n.d.).

Currently, Moscow generates one-fifth of Russia's GDP. The largest and most expensive infrastructure objects, as well as the most complex and ambitious social projects, are implemented in Moscow, which is made possible due to the especially high municipal budget. In 2020, Moscow was ranked second globally in terms of local government efficiency by the World Smart Sustainable Cities Organization (Ministry of Economic Development of the Russian Federation 2020). This became possible partly because the Moscow authorities were among the first in the country to cooperate with business and private investors on a large scale.

As of January 2020, the value of signed PPP contracts in Moscow exceeded 1 trln. RUB. Most of them were life cycle contracts (more than 500 bln. RUB) or long-term agreements with an investment component (241 bln. RUB). At the same time, concession agreements attracted 67.5 bln. RUB and the so-called corporate forms of PPP contracts amounted to over 135 bln. RUB (Moscow Investment Portal n.d.).

One of the important PPP projects in Moscow is the program on increasing local production of baby food, which is distributed to the young families via special pick-up points. This project is essential to the social policies of Moscow – it supports nursing mothers and families with infants (Moscow Investment Portal 2016).

The development of PPP should aim to increase both quantitative (e.g., the number of projects and agreements) and qualitative indices. In this regard, a precedent that took place in St. Petersburg is particularly interesting: the city authorities announced a concession tender for the construction of the Kupchino-Slavyanka tramway line, worth almost 90 bln. RUB. Various large investors applied for the tender; the project of the private construction company *BaltNedvizhServis* has won. However, *VTB* Bank, whose bid was 17 bln. RUB more expensive than the winning project, tried to contest the tender results for a long time (Ivanova 2018).

It is important to use good faith pre-negotiations in the development of PPP projects and adhere to the principles and norms of civil law. Negotiations are an important part of concluding agreements; they allow both parties to provide and receive full and reliable information about the project, facilitating the conclusion of the agreement (provided that both parties seek to enter an agreement) and giving a better understanding of advantages and disadvantages of entering a PPP agreement (Dzhioeva 2019).

As a result of this study, the authors reached several conclusions:

1. The state is willing to attract private investments for the development and modernization of the public and social sectors, but the legal-regulatory framework is not able to fully ensure fair regulations for private investors in such projects.
2. Over the past few years, Moscow has been the leader in the number and effectiveness of PPP projects in Russia. This was made possible thanks to the gradual and multidirectional urban development strategy, where attracting private investment to social facilities is key. Investors bring to the table not only the investment capital but also their vision of the problems in the social sector and solutions to these problems.
3. The annual "Rating of the PPP development in the Russian regions" accounts for various factors, such as the development of the institutional environment in a particular region, the state of regulatory-legal support, and experience in implementing PPP projects. In 2019, the Samara Region, Moscow, and the Moscow Region were at the top of this Rating. At the bottom of the Rating were the Bryansk Region, the Republic of Ingushetia, and the Republic of North Ossetia—Alania. On the one hand, these results identify the most attractive regions for private investors, which promotes the interest of businesses in the social infrastructure of the top regions in the next year. On the other hand, the

Rating does not account for the investment capacity of specific regional sectors and the elementary needs of the regions in the current year. Nevertheless, the fact that some regions regularly rank low in the Rating will attract the attention of federal regulatory bodies and local legislative bodies, calling local authorities to action. Despite all the shortcomings of the Rating methodology, its results generally coincide with the real level of socio-economic development in the lowest ranking regions. In other words, the lowest ranking regions desperately need private investment in infrastructure, but there are little to no conditions for PPP, and the regions themselves are unattractive to long-term investors.

4. The authors propose the following measures for promoting the development of PPP in Russia:

   - Increasing the qualifications of local government staff would improve the efficiency of project management, decrease bureaucratic burden, and facilitate the interactions between the authorities and businesses;
   - Using a systemic approach to managing PPP programs would improve the transparency and efficiency of all project stages: from identifying to implementing and concluding the project;
   - Providing information, legal, and methodical support for better implementation of the concession mechanisms, not only for local authorities but also for potential investors and stakeholders;
   - Facilitating inter-regional communication and knowledge sharing on PPP issues via information websites, thematic business events under the auspices of the Ministry of Economic Development, and broader methodical and organizational support for programs involving municipal authorities and businesses.

5. The authors also propose several amendments to Federal law No. 224-FZ aimed at:

   - Regulating cases where municipal authorities only partially honor their contractual obligations before private investors;
   - Regulating public disclosure and transparency in implementing PPP projects. These provisions will significantly reduce the risks that bureaucracy carries.

4 Conclusion

In conclusion, one can state that the current Russian legislative system offers various mechanisms and tools for implementing PPP projects (Russian Federation 2006). Among these are concession agreements (Russian Federation 2005), investment funds, special economic zones, etc. However, there are several areas in which the legislation is lacking and needs further development to stimulate the institute of PPP in Russia.

First, all the established trends and existing regulatory documents must be brought into a single concept that would clearly and precisely define the mechanisms of PPP for parties and give an understanding of the future development of the system.

Second, some Russian regions still have regional laws established before the adoption of Federal law No. 224-FZ. These earlier laws not only contradict the Federal law but also are extremely outdated. Unifying the normative-legal system is the most important task of Russian lawmakers today.

Third, the example of Moscow experience in using PPP for the social sector shows that the symbiotic relations between the state and businesses can yield high results in renewing infrastructure and constructing new objects. Effective PPP development requires the local governments to considerably improve their own efficiency, transparency, and legal regulation.

Fourth, other regions of Russia could use the experience of Moscow in developing PPP. For this purpose, regional authorities must create policies on municipal PPP, appoint a single regulatory body with the necessary powers, and establish uniform regulations on inter-agency cooperation on PPP issues. Other effective regional measures include: increasing transparency, fighting corruption, reducing bureaucratic burden, and training officials and local representatives.

Fifth, the development of PPP correlates with the long-term national development projects of Russia. The adopted legal provisions and national development strategies must solve the current economic problems. However, the success of national projects depends on the consolidation of efforts of the government, businesses, and society. Provision of a decent standard of living in all regions via the social sector development is a top priority. Further evolution of the legal system must be built upon this goal and serve its tasks. One cannot imagine social development without the participation of the general public, businesses, and private investors.

Sixth, the current main regulation of PPP (Federal law No. 224-FZ) did not ameliorate all the issues in the legal status of PPP parties and the problems that limit PPP development. Other major problems of PPP development include:

- Expanding the list of objects that the PPP agreements can include, as well as the forms of project implementation;
- Providing a detailed description of the administrative actions algorithms in organizing and implementing PPPs;
- Developing anti-corruption mechanisms in PPP tenders;
- Promoting competition in PPP;
- Imposing standards on the legal forms of interaction between investors and public entities at different levels;
- Using single methodology for evaluating the efficiency of PPP, choosing projects as a part of tenders, assessing project results;
- Legal regulation of mechanisms that distribute risks and liabilities among parties to PPP;
- Legal regulation of methodological basis for the development of non-concession PPP forms;
- Harmonization of regional and federal regulations on PPP.

The development of PPP is a real and effective tool for the modernization of regional social sectors. Its active use in Russian regions would promote the development of social infrastructure, improving the standing of a region not only in the "Rating of the PPP development in the Russian regions" but also in the rating of governors. However, PPP development is only possible with further evolution of legal foundation for cooperation between the state and businesses.

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Experience and Prospects for Improving the Organization and Management of Cooperative Business Structures

World Cooperative Economy: Development Trends

Olga V. Kaurova, Olga V. Shinkareva, and Alexander N. Maloletko

Abstract The main objective of this research is to analyze the world cooperative economy over the past few years, based on data provided by the International Cooperative Alliance on the performance of 300 of the world's leading cooperative organizations. The dynamics of the turnover of companies was studied, the leading countries of the cooperative movement were considered, the most powerful industries in the world cooperative economy were revealed. In order to achieve the goal, a number of scientific methods were used, such as grouping and comparison, analysis and synthesis, tabular and graphical methods. The leading countries of the world cooperative economy have been identified—the United States of America, France, Germany, Japan and the Netherlands. It is noted that the world cooperative economy is most developed in such sectors as insurance, agriculture and agricultural production, wholesale and retail trade. It is noted that cooperatives are one of the largest employers. Most notably, more than 770 thousand employees work in the top five of the largest cooperatives in the world. The results of the research provide the possibility of their application in further scientific developments on this topic or similar topics. The novelty of the research consists in processing data on the turnover dynamics of the world's leading cooperative enterprises and analyzing trends in the development of the world cooperative economy.

Keywords World economy · Consumer cooperatives · International cooperative alliance · Trends · Development

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1 Introduction

Cooperatives, as an association of people or organizations created in order to achieve common economic and social goals, play a prominent role in the world economy (Sorokina and Zarubina 2011). The International Labour Office, a permanent secretariat of the International Labour Organization, notes that the global cooperative movement is an association whose membership exceeds the number of members of the trade union movement, employs more people than all transnational companies, and its economy can be compared with the economies of some G-20 countries (The Role of Cooperatives in Achieving the Sustainable Development Goals—The Economic Dimension 2014).

The leading non-governmental international association, the International Cooperative Alliance, regularly analyses the activities of the international cooperative movement, compiling the report "Monitoring the World Cooperative Economy" (hereinafter—the Report). These reports analyze the activities of the largest cooperatives in the world, assess the contribution of world cooperation to the economy. The analysis of these reports makes it possible to assess the trends in the development of the world cooperative movement in general and in terms of individual continents and countries.

2 Materials and Methods

The World Cooperative Monitor reports from 2012 to 2019 were used as research materials (The World Cooperative Monitor. Exploring. The Cooperative Economy. Report 2019). The latest report (hereinafter—Report 2019) was formed on the basis of data obtained by the International Cooperative Alliance from the financial statements of 2017. In order to compile this report, the organization investigated the activities of 4575 cooperatives: 1152 companies represented Europe, 3218—America, 197—Asia and the Pacific and 8—Africa. Scientific studies of various scientists in the field of cooperative movement were also used (Bogoviz et al. 2021; Shinkareva et al. 2021).

In order to achieve the goals of the research, such scientific methods as grouping and comparison methods, analysis and synthesis, tabular and graphical methods, etc., were applied.

3 Results

Compared to 2012, the turnover of the 300 largest world cooperative enterprises (cooperatives, their groups and associations, mutual assistance companies and non-cooperative enterprises, whose founders are cooperatives) grew by 3% and amounted

to 2034.98 billion US dollars. The world cooperative movement was most developed in such sectors of the economy as insurance, agriculture and agricultural production, wholesale and retail trade.

The most developed cooperative movement in countries such as the United States of America, France, Germany, Japan, the Netherlands, and the geography of the presence of the largest cooperative organizations is expanding—if the first Report of 2012 Year included representatives of 24 countries in the top 300 cooperatives, then in the 2019 Report—27 countries, while the largest cooperatives in the world pay special attention to the development of their employees and try to stop cases of discrimination.

At the same time, not a single Russian cooperative organization was included in the rating of the largest cooperatives for all the time of reporting, and, unfortunately, it should be stated that the Russian Federation is not any serious player in this field.

4 Discussion

The turnover of the world's largest cooperatives is shown in Table 1.

It should be noted that the turnover of the 300 largest cooperatives in the world is comparable to the gross domestic product of the countries included in the first world ten—Italy, Brazil and the Republic of Korea. This indicates the power of the world cooperative movement. At the same time, the development of the largest companies cannot be called growing—if, according to the reporting of 2012–2016, turnover growth is visible (from $1975.6 billion in 2012 to $2533.1 billion in 2016), then over the next two years—a certain decline (up to US $2108 billion), and the 2019 Report alone shows a slight positive trend, showing a turnover increase of US $17 billion compared to the previous year, to US $2035 billion. Although not the entire turnover of cooperative organizations of the world is given, but the dynamics of turnover

Table 1 Turnover of the 300 largest cooperatives in the world, in billion US dollars

Report year	2012	2013	2014	2015	2016	2017	2018	2019
Turnover of the 300 largest world cooperatives	1975.6	2098.6	2205.7	2360.1	2533.1	2164.2	2018.0	2035.0
Turnover of the first three world largest cooperatives	189.7	206.1	204.7	187.2	229.2	203.2	213.3	211.2
Turnover of the top ten of the world's largest cooperatives	528.5	545.8	575.4	545.6	645.0	535.8	550.0	531.1

Source Compiled by the authors on the basis of The World Cooperative Monitor. Exploring. The Cooperative Economy (The World Cooperative Monitor. Exploring. The Cooperative Economy. Report 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019)

of the largest companies can be judged by the world cooperative economy—it is developing erratically, there is no constant positive dynamics.

Consider the dynamics of the turnover of the first three and a dozen of cooperatives—the leaders of the rating in the corresponding years. It can be noted that the turnover of the leaders of the rating during the study period increased (by 11%—at the top three, by 4.9%—at the top ten), but this growth was not progressive—the largest turnover was shown in the Report 2016, followed by a decline. It should be noted that the composition of the leaders did not change much during the analyzed period—only 3 companies from the top ten of the 2012 Report were not included in the top ten of the 2019 Report, while significant movements occurred within the top ten, and the top three were completely changed—if in the 2012 Report in the first two places were Japanese organizations (Zenkyoren and Zen-Noh (National Federation of Agricultural Co-operations), and in the third—German (Edeka Zentrale), French cooperatives took the first two places in the 2019 Report (Groupe Credit and Groupe BPCE), and in the third—another German company—REWE Group.

Let us proceed to the countries which representatives are among the largest cooperatives in the world in terms of turnover in United States dollars (Table 2). In the top 300 turned out to be cooperatives of 27 countries of the world in the report of 2019, while in the Report of 2012 there were only 24. Seven countries have the largest representation in the ranking (they contain more than 70% of the number of companies included in the rating): The United States of America is the leader (81 company in the 2012 report and 85 in the report of 2019). Other countries have significantly fewer cooperatives in the ranking:

- France (38 in Report of 2019 and 41 in Report of 2012),
- Germany (30 and 35 respectively),
- Netherlands (18 and 10),
- Japan (18 and 19),
- Italy (14 and 21),
- Finland (10 and 10).

It can be noted that following countries had the number of their companies decreased—France, Germany Italy, while the USA and the Netherlands have increased their representation. A significant decrease in the number of French companies should be noted as well (and compared with the 2018 Report, where there were 49 cooperatives in the ranking, their number decreased even more), but at the same time French companies took the first two places in the rating. Germany, on the contrary, increased the number of its representatives in the top 300 compared to the previous year (24 organizations). If we talk about the countries that were ranked in the report of 2019, not being ranked in the report of 2012, then we can note countries such as Argentina (2 representatives), Saudi Arabia, Malaysia and Poland (1 representative each). African companies are not represented in this rating.

At the same time, the 2019 Report gives a rating of 300 cooperatives not only in terms of turnover in US dollars, but also a rating of cooperatives based on the turnover of gross domestic product per capita, and the distribution of countries there is slightly different (Table 2).

Table 2 Distribution of the 300 largest cooperatives in the world by country (by number)

Country	Number of cooperatives in the top 300 cooperatives in the world (in terms of turnover in US dollars)	Number of cooperatives in the top 300 cooperatives in the world (by GDP turnover per capita)
USA	85	53
France	38	38
Germany	30	28
Japan	18	18
Netherlands	18	14
Italy	14	17
Finland	10	10
Canada	8	8
Denmark	7	6
Great Britain	7	7
Sweden	7	7
Norway	7	4
New Zealand	7	6
Switzerland	6	5
Australia	6	3
Austria	5	5
Brazil	5	6
Belgium	4	4
Spain	4	4
South Korea	4	4
India	2	14
Argentina	2	7
Singapore	2	2
Ireland	1	1
Saudi Arabia	1	1
Malaysia	1	1
Poland	1	2
Colombia		10
South Africa		3
Turkey, Kenya		2 companies in each country
China, Philippines, Bolivia, Costa Rica, Jamaica, Mexico, Uruguay, Algeria		1 company in each country

Source Compiled by the authors on the basis of The World Cooperative Monitor. Exploring. The Cooperative Economy (2019)

The analysis of Table 2 helps to identify not only countries in which cooperatives occupy the leading world positions in terms of turnover in US dollars, but also to consider the development of the cooperative movement in countries according to the criterion considering the top 300 cooperatives in terms of turnover of gross domestic product per capita. It can be noted that the leader—the United States—remained the same, but the number of companies representing this country is significantly less (53), in countries such as France, Germany, Finland and Japan as a whole the number of representatives has not changed. At the same time, India and Argentina increased the number of companies in the ranking according to this criterion, and Colombia, which was not included in the ranking of the largest cooperatives in the world, showed the development of the cooperative movement in the country, taking into account the population—10 of its representatives in the ranking. It should be noted that Africa (South Africa, Kenya, Algeria) is also represented in this ranking. However, according to no criteria, the Russian Federation, which is among the leading countries in the world economy—12th place in terms of gross domestic product (International Monetary Fund 2019) was not included in the rating. This indicates the underdevelopment of the cooperative economy in the country, as well as the fact that in the world cooperative movement Russia does not play any significant role, inferior even to individual countries in Africa.

Consider the industries where the cooperative movement is most advanced (Fig. 1).

It should be noted that almost 40% of the world's largest cooperatives (both in terms of turnover and in terms of turnover adjusted for GDP per capita) are engaged in insurance, while the share of this sector decreased slightly compared to the beginning of the study period, when 43% of the largest cooperatives were engaged in insurance. The share of agricultural cooperatives is also large—almost about a third, and is constantly increasing. More than 17% of the largest cooperative organizations are engaged in wholesale and retail trade. These are the three industries

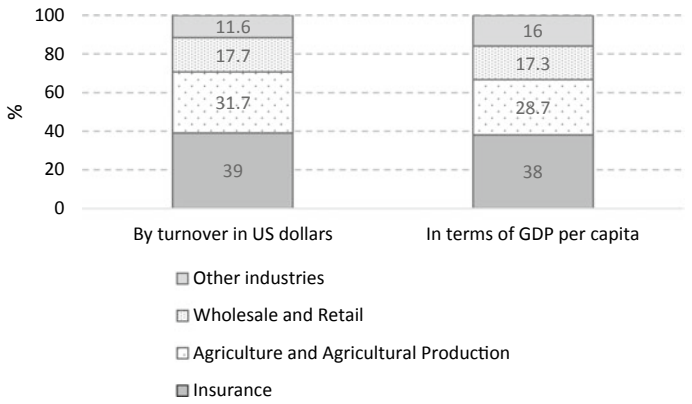

Fig. 1 Distribution of the 300 largest cooperatives in the world by industry (by number). *Source* The World Cooperative Monitor. Exploring. The Cooperative Economy (2019)

in which cooperation is most developed. The share of other industries is low and in total does not exceed 20%.

It should be noted that cooperatives are not only organizations created to meet the needs of their participants, but also, like all other organizations, they are employers with hired employees. Cooperatives provide employment in one form or another to 10% of the working-age population (International Cooperative Alliance 2020). The number of employees in almost all the largest cooperatives in the world exceeds several thousand people, and in 7 cooperatives from the top 300 ranking, the number of employees is more than 100,000 in each. The five largest cooperatives in the world employ more than 770 thousand employees. For comparison, the number of employees in the world's largest company according to Forbs 2000 rating, the Industrial and Commercial Bank of China employs 449 thousand people, the second largest is JP Morgan Chace—256 thousand people, and the first five totals more than 1.7 million people (Global 2000; The World Cooperative Monitor. Exploring. The Cooperative Economy. Report 2019). Therefore, the comparability of these indicators can be noted, and although leading cooperatives are still inferior to world leaders, their role in the labor market is very noticeable.

In this context, it is encouraging that many of the world's leading cooperatives pay much attention to working conditions. In particular, in many cooperative leaders who have provided reports in this area, the percentage of permanent workers exceeds 80–90%. According to a study by the International Cooperative Alliance, although it notes a limited sample, the salaries of employees are determined on the basis of their qualifications and experience, and not gender. The fight against discrimination is carried out not only on the basis of sex, but also on the basis of race, age, ethnic origin, etc., through education, counselling, as well as the adoption of ethical codes of conduct and procedures. One notable example is the Achmea Cooperative (Netherlands, 23 ranked in the top 300), where the manual is not only prepared to assess cases of discrimination, but also a group of consultants has been created to provide support and assistance to workers who have been subjected to it in the workplace (Achmea and a sustainable society 2020; The World Cooperative Monitor. Exploring. The Cooperative Economy. Report 2019). An important aspect is the development of "hard" and "flexible" skills among employees, the formation of their entrepreneurial career, and their awareness of sustainable development goals, including sustainable development. An example is the REWE Group (trade, one of the top three top 300), which in 2016 began the introduction of training programs to understand the importance of sustainable trade development (GRI-Bericht der REWE Group (2020); The World Cooperative Monitor. Exploring. The Cooperative Economy. Report 2019).

5 Conclusion

The world cooperative movement is gradually developing, covering more and more countries. Although the trajectory of its development cannot be called growing constantly, nevertheless, there is an increase in both the turnover of the world's

leading cooperatives and the number of countries in which cooperatives are created—world leaders. At the same time, cooperatives provide work for a significant part of the working-age population, and a significant part of them seeks to develop their workers, eliminate discrimination and establish equality in labor relations.

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Integration of Controlling and Balanced Scorecard as the Basis for Building an Accounting Management System

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Abstract The purpose of the work was to identify the most effective methods and methods of collecting and processing information, which can, at the lowest cost, create, adapt and implement, give the best result in terms of long-term planning of the organization's activities in crisis situations. Significant conditions were: maximum use of available management tools, ease of use, quality of information received, ability to adapt to rapidly changing operating conditions of the organization. A study of production companies, service organizations of trading enterprises, the use of analysis and synthesis of information, comparison and synthesis of the obtained data, the graphical method and the method of extrapolation, made it possible to determine the optimal management technologies that guarantee the best result. Strategic controlling, does not lose its relevance during the global crisis, new challenges require non-standard solutions. The Balanced Scorecard (BSC) is a synthesized phenomenon created by the retrospective nature of financial reporting and the active search for new opportunities, enabling the identification of negative trends and the timely reallocation of resources. The mutual addition of controlling and BSC can contribute to the emergence of a new management technology. In addition, in terms of recommendations, attention should be drawn to the insufficient utilization of the continental accounting model, which allows the collection of data for almost any management technology. And the available information resources allow you to receive fairly objective information about changes in the external environment of an economic entity. The combination of the above factors allows us to mitigate the negative consequences of the world crisis, adapt to changing conditions as quickly as possible, and expect a relatively rapid restoration of activity.

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1 Introduction

The economic situation of 2020 is unique and still not predictable. Perhaps it is the first time when the world faced a new version of the economic crisis. If negative situations in the world economy could be conditionally classified as structural, cyclical, event-oriented, then the peculiarity of this year is that the event crisis is, in fact, manageable. Governments of different states introduced and introduced a variety of restrictive measures, various support programs, forced to reallocate resources, etc., in order to influence the negative results of the pandemic in a single country. It is difficult to assess the impact of this kind on the economy in a crisis situation, but there is every reason to believe that timely and reasonable support measures, thoughtful restrictions and speed of decisions will allow us to expect a relatively rapid recovery compared to other crises. How much the consequences of this crisis will affect is unknown, according to some analysts, the 2008 crisis has not passed without a trace for our country to date.

It is quite difficult to talk about a balanced strategy for the development of an economic entity, when not only the usual features of doing business in Russia, but also world trends become unpredictable. However, even in such a situation or even more so, it is advisable to use the mechanisms and tools provided by modern management technologies.

From the point of view of the rationality of the organization of the accounting and analytical process, controlling seems to be the most effective system that allows you to count on timely and complete information for informed management decisions.

2 Materials and Methods

The materials of the research in the theoretical aspect are the works of Russian and foreign scientists on modern cost accounting systems, cost calculation, management technologies such as controlling and balanced scorecard.

In order to fully study modern management technologies and generate data for them within the framework of the current accounting system of the organization, as well as the features of their implementation and use, to identify certain patterns of their functioning and development in crisis conditions, research methods such as:

- observation of peculiarities of implementation and use of strategic controlling at production enterprises of various spheres of activity;

- monitoring the activities of the economic entity and its use of modern management technologies;
- analysis and synthesis of information, including that obtained by means of interviews and questionnaires of employees of economic services investigated by the organization;
- comparison and synthesis of the obtained data, on the basis of a deep and thorough check for the relevance of information, its logic and reliability;
- graphic method and extrapolation method.

This article is based on numerous published works on the problem posed, in particular, on the works of: Zubareva (2017), Krashennikova (2015), Khan (1997), Bodrova et al. (2021), Rykhtikova et al. (2018), Veselovsky et al. (2016), Volkov et al. (2018) and Vuko and Ojvan (2013).

3 Results

A balanced scorecard and how this economic actor's strategic performance management tool can now be used is of good interest. The issue of the alignment of strategic controlling and the balanced scorecard (BSC), the potential, feasibility and need to share them at present, as well as the strategic management of the organization as a whole, is not negligible.

Controlling, as a system of interconnected plans and reports, allows, based on the maintenance of full-fledged accounting, to influence the costing, financial and balance sheet results of an economic entity.

Strategic controlling, in turn, is used to develop a strategy for the success of an economic entity and at the same time monitor the implementation of this strategy, to respond in a timely manner to the rapidly changing external and internal conditions of the organization.

Costing result controlling is actually the control of the cost of goods produced, works performed, services rendered. Cost accounting and cost calculation can be carried out within the framework of the most suitable system for the organization. The deep penetration of controlling into accounting procedures, and in fact the complete absorption of classical accounting by them, gives them unlimited opportunities to collect and summarize information about costs at any stages of the production process. The only problem is the degree of detail of the information, that is, setting up analytical cost accounting, as well as summarizing the data.

4 Discussion

Of course, the underlying cost accounting system of Director Costing is not questioned and the calculation of interim results of margin income does not lose its

relevance. The continental accounting model used in Russia allows you to set up cost accounting (previously called "production") for unique information requests of internal users not only in terms of cost classification, but also in the temporary aspect. However, costing result management is most relevant for operational controlling. For the long term, in conditions of uncertainty, rapid change and dynamics of factors, the feasibility of producing a product as a whole is more closely considered than fluctuations in its cost.

Financial Result Controlling is actually a financial responsibility center management that is required at the sustainable development stage of the enterprise, when cash flows become significant and there is a need for comprehensive monitoring and strict management of them.

You can look at this process and on the other hand, managing the financial result is actually managing the profit of the organization (although the cost has a significant impact on profits), it is possible to influence other activities of the economic entity, derive the maximum result from the turnover of the organization's funds and assets, take care of the financial security of investment activities, etc. It is clear that this area of activity also involves consideration of alternative developments; the role of the temporary aspect is significantly increased.

Controlling balance sheet results primarily interests business owners. It is the result of ongoing work and directly shows the effectiveness of the financial and economic activity of an economic entity, changes in the size and structure of assets, sources of funds of the organization, allows you to draw up development forecasts for the short, medium, long term, see and plan changes in the whole organization. Accordingly, business owners take a direct part in the distribution of profits, determining development prospects, financing new areas of activity, if it is necessary to diversify production, and helping to overcome possible crisis phenomena.

Strategic controlling, that is, a system of interconnected plans and reports for the long term for an economic entity wishing to remain in the market, does not lose its relevance in these conditions of the global crisis, while new challenges require non-standard solutions.

One of the functions of strategic controlling is to ensure balance, linking the strategic plans of the company and its structural divisions. Therefore, plan and report systems are detailed to a separate unit of management in conditions of uncertainty as well as in a calmer time.

The four stages of the development of management systems allocated by I. Ansoff assumed:

- traditional management after the events;
- at acceleration of events, control based on extrapolation;
- with the acceleration of events and unexpected events accompanying them, which could nevertheless be assumed, management on the basis of foresight;
- with the rapid acceleration of events and the emergence of unexpected phenomena that would be difficult to assume, management based on flexible emergency solutions (Ansoff 1989).

The development of controlling as a management technology, including within the framework of the strategic management methodology, involves the development of scenarios for the development of the situation. At the same time, the following sequence of actions should be clearly traced:

1. Assessment of development options and, as a result, development of business adaptation options;
2. Comparison of enterprise prospects in different activities and identification of priorities;
3. Assess its capabilities and adjust priorities;
4. Analysis of ways of business diversification;
5. Definition of diversification conditions.

Strategic controlling can answer questions to varying degrees.

Controlling covers the entire accounting process, with the utmost accuracy and is fully integrated into the accounting system of the organization. It is also true to the contrary that accounting and analytical procedures can be a characteristic of information support for management decisions. If the final stage of the accounting process is exclusively the preparation and presentation of accounting (financial) statements in accordance with the established procedure and there is no strategic rethinking of the data obtained, then you should rely solely on the will of the case, wandering in search of competitive advantages, effective investments, profitable contracts, unique hardworking personnel, etc.

A balanced scorecard (BSC) is, in the opinion of its creators R.S. Kaplan and D.P. Norton, is a kind of synthesized phenomenon created due to the "non-rotation of the accounting financial reporting model," as well as the active search and creation of "wide competitive opportunities" (Kaplan and Norton 2006).

The BSC kind of complements financial information about events that have already been completed. After all, in any case, traditional, classical, correct and competent accounting is, indeed, in the first place, retrospective accounting of already completed facts of economic life. A balanced system of indicators is aimed at finding and valuing the competitive advantages of an economic entity. In a crisis situation, when many enterprises cannot withstand acutely manifested negative trends, the opportunity to stay on the market, save the company, staff, quickly restructure business processes, find new areas of activity is unusually in demand.

With all the variety of factors affecting the success of the company, they can be grouped into four main areas of activity, the relevance of which is only increasing in the crisis.

The implementation of the business strategy is based on such areas of the financial component as: maintaining and growing income, and expanding activities, reducing costs (expenditures) and increasing productivity, using assets and investing activities. It is possible to achieve the desired financial results by rationally organizing activities in the following three areas.

It is difficult to overestimate the client component in a crisis situation. Offering consumer value to a target group of customers is a fundamental factor in setting forward goals and developing relevant indicators. The starting point here is the

profitability of the client, the ability to meet his needs as much as possible. The client's interest in the organization can be traced to the following indicators: changing market share, expanding the customer base, maintaining the customer base, meeting customer needs.

The achievement of certain financial indicators and interaction with customers is based on the improvement of internal business processes, for which it is necessary to determine the full value chain and, therefore, to develop all the necessary indicators of intra-company planning.

5 Conclusion

Therefore, a balanced scorecard covers the entire accounting process with the necessary and sufficient accuracy for planning, as if determining, calculating the necessary indicators, based on data accumulated in the existing accounting system. It is simple and understandable to the absolute majority of interested users of information, it can be used to make informed, including strategic management decisions.

The presented analysis of the conceptual framework of controlling and a balanced scorecard shows that the reasonable integration of these two management technologies in the temporary aspect, by accounting processes, of analytical detail, will achieve significant results. In this regard, controlling acts as an expanded accounting system, and a balanced scorecard is the final stage of the accounting process—reporting to internal interested users.

Using each of these management technologies separately leads to a loss of managerial performance. Sharing can have a certain synergistic effect. In Russia, controlling and a balanced system of indicators, if used, often partially, therefore, this gives additional opportunities not only to choose the option of sharing them, but also to adapt quickly without loss to the needs of its economic entity.

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Description of Probabilistic Seasonal Economic Processes

Mikhail M. Ermilov, Svetlana V. Zybenko, and Liudmila E. Surkova

Abstract The work considers the possibilities of mathematical modeling of periodic and seasonal processes using the Markov process apparatus. The possibilities of describing multidimensional probability systems using vector-matrix equations proposed in the twentieth century by the Soviet mathematician academician Andrey Kolmogorov, and, independently, the English mathematician Sydney Chapman, are studied. It is known that obtaining general analytical solutions of equations of this kind, on the one hand, is possible, but as a rule, involves significant computational difficulties. Moreover, the obtained bulky expression is very difficult to analyze, it is difficult to determine the influence of certain input parameters on the result. On the other hand, it is also known that these difficulties are greatly reduced if, by sacrificing the study of transients, only so-called established solutions are satisfied; in this case, the problem actually comes down to the well-studied problem of determining eigenvalues of matrices (linear operators). The purpose of the article was to obtain solutions to equations at the periodicity of changes in both the signals (for example, economic applications) entering the system and the properties of the system itself. It was desirable to obtain solutions of some intermediate form, in which, on the one hand, comparative simplicity is still preserved, and on the other, it is no longer one single settled solution, but their whole family, which allows us to analyze the stages of processes in the system in much more detail at various points in one period. It was found that the periodicity of the processes under consideration allows to generalize well-solved stationary problems. The properties of Fourier transformations of probability vectors and transition matrices have been clarified.

Keywords Random processes · Markov processes · Statistical forecasts · System · Multitude · Modeling

JEL Codes C020 · C3

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1 Introduction

To date, the so-called Markov processes are rightfully among the most powerful mathematical models of random processes, or otherwise, processes with final memory (Romer 2001). They successfully combine both moderate complexity in the computational plan, and, most importantly, the ability to build various statistical forecasts. In this regard, this research is relevant.

The goal of the research is the possibility of describing systems that may be in one state or another, and the counting set of these states is fixed. In order to achieve this goal, we will solve the following problem. As one example, we will consider some abstract hotel with a given number of rooms. At the same time, depending on various external circumstances, in particular the time of year, the intensity of applications from potential guests can vary very significantly. The system state is naturally characterized by the number of busy numbers (Gardiner 1986).

Let's say observations of a system are made rather often, with an identical time interval, rather small that for this interval no more than one application could appear (in the mathematical theory such accidental processes are called ordinary). Stay probabilities systems in each state are introduced; generally, these probabilities are functions of time.

2 Methodology

Methods of analysis and study of works in this direction, mathematical modeling, search of extremum of functions and entropy method (Panyukov 2015) are used in the work. The materials of the article are theoretical studies of consumer behavior.

Theoretical and applied questions on the problem studied in this article are disclosed in the works of Saati Thomas (2010), Greene William (2002), Nikolenko (2009) and Jaynes (1982, 2003).

The authors also used the materials from Mathematcal Metods for physists, Econometric analysis (2016) and Hayashi Fumio Econometrica (2017).

3 Results

The law of change in these probabilities is usually described using the Kolmogorov-Chapman equations, which have the form of vector-matrix equality:

$$\mathbf{p}(t + \Delta t) = A(t)\mathbf{p}(t + \Delta t),$$

where $\mathbf{p}(t) = (p_1(t), p_2(t), \ldots p_n(t))^T$—a vector, elements of which are probabilities of finding the system in the 1st, 2nd,…, n states (Borovkov 2017).

We will call the matrix $A(t)$ a transient matrix: it defines the law of the transition of the probability vector when the moment of time changes.

Consider the case when during one period (season) T measurements (observations) are made at equally spaced points of time equal to $t = 0, 1 \dots T - 1$.

The value of time intervals, if equal, without limiting commonality can always be considered equal to one by selecting the appropriate unit of time. Further, we will proceed from the assumption that both transition matrices and probability vectors periodically change over time, with a period T (Popkov 2015).

We renumber all matrices in the order of their sequence, and in the same way—probability vectors. Now for each interval you can write Kolmogorov-Chapman equations

$$\begin{cases} \mathbf{p}_1 = A_0\mathbf{p}_0 \\ \mathbf{p}_2 = A_1\mathbf{p}_1 \\ \vdots \\ \mathbf{p}_{T-1} = A_{T-2}\mathbf{p}_{T-2} \\ \mathbf{p}_0 = A_{T-1}\mathbf{p}_{T-1} \end{cases} \tag{1}$$

A comment about the last equation of the system: it is it that maps the periodicity of the transition matrices and vectors.

By successive substitutions, we can obtain an equation only for any one probability vector, for example, for $\mathbf{p}_0$:

$$\mathbf{p}_0 = A_{T-1}\mathbf{p}_{T-1} = A_{T-1}A_{T-2}\mathbf{p}_{T-2} = \cdots = A_{T-1}A_{T-2}\dots A_0\mathbf{p}_0,$$

meaning

$$\mathbf{p}_0 = A_{T-1}A_{T-2}\dots A_0\mathbf{p}_0 \tag{2}$$

It follows from (2) $\mathbf{p}_0$ that it is the eigenvector of the product of transition matri $A_{T-1}A_{T-2}\dots A_0$.

Similarly, equations for all other vectors are obtained by successive cyclic permutations of matrices

$$\begin{cases} \mathbf{p}_1 = A_0A_{T-1}A_{T-2}\dots A_1\mathbf{p}_1 \\ \mathbf{p}_2 = A_1A_0A_{T-1}A_{T-2}\dots A_2\mathbf{p}_2 \\ \vdots \\ \mathbf{p}_{T-1} = A_{T-2}A_{T-3}\dots A_0A_{T-1}\mathbf{p}_{T-1} \end{cases} \tag{3}$$

Enter in (2) and (3) the value

$$\begin{cases} M_0 = A_{T-1}A_{T-2}\dots A_1A_0, \\ M_1 = A_0A_{T-1}A_{T-2}\dots A_1, \\ \vdots \\ M_{T-1} = A_{T-2}A_{T-3}\dots A_0A_{T-1} \end{cases} \tag{4}$$

Then (2) and (3) can be written shorter

$$\begin{cases} \mathbf{p}_0 = M_0\mathbf{p}_0, \\ \mathbf{p}_1 = M_1\mathbf{p}_1, \\ \vdots \\ \mathbf{p}_{T-1} = M_{T-1}\mathbf{p}_{T-1} \end{cases}$$

Matrices M_t pass into each other by formulas:

$$\begin{aligned} M_1 &= A_0M_0A_0^{-1}, \\ M_2 &= A_1M_1A_1^{-1} \\ &\vdots \end{aligned}$$

and so on. As is known, matrices transformed into each other in a similar manner are called similar. Their most significant property is that they have the same spectra of eigenvalues.

For the sake of correctness, it should be shown that any products of transition matrices are always also transition matrices. To do this, consider some abstract Kolmogorov equation

$$\mathbf{p}_1 = A\mathbf{p}_0$$

Since the sum of the elements of the probability vector $\mathbf{p}_0$ is one, the $\mathbf{p}_1$, vector should have the same property, since it is also probabilistic.

To make sure of this, take the string vector $\mathbf{e}^T$, all elements of which are equal to one, and find its scalar product on the left and on the right sides of the last equality. Note that on the left, the sum of the elements of vector $\mathbf{p}_1$, is automatically formed, and on the right in place of the transition matrix is the sum of all its rows. Since any vector $\mathbf{p}_0$ on the right should result in one, we conclude that the sum of all rows of this matrix should again be equal to a row of units, that is, $\mathbf{e}^T$. Otherwise, this sum could not remain equal to one for any $\mathbf{p}_0$.

Lemma 1 *Any transition matrix has a left eigenvector* $\mathbf{e}^T$*, which corresponds to an eigennumber equal to one.*

Therefore, in Eqs. (2) and (3) there should be such probabilistic vectors for which, as follows directly from these equations, the eigennumber is also one.

The characteristic properties of the periodicity of transition matrices should now be discussed.

Since the sequence of transition matrices $A_0, A_1, \ldots A_{T-1}$ is reproduced in time periodically with a period equal to time units, this sequence of matrices allows a discrete Fourier transform (DFT), which allows for all transition matrices to write a standard representation

$$\begin{aligned} A_t &= \sum_{s=1-T}^{T-1} C_s \exp\left(2\pi i s \frac{t}{T}\right); \\ C_s &= \frac{1}{T} \sum_{t=1-T}^{T-1} A_t \exp\left(-2\pi i s \frac{t}{T}\right) \end{aligned} \tag{5}$$

Here, there is C_s, $(s = 0, 1, 2, ..., T-1)$—a matrix Fourier transform of the original transition matrices. Matrices C_s have specific properties of eigenvalues, which we write in the form of Lemma 2:

Lemma 2 *The string vector* $\mathbf{e}^T$ *is the eigenvector of each of the matrices* C_s*; wherein for matrix* C_0 *this vector corresponds to an eigennumber equal to one and for matrices* $C_1, C_2, \ldots C_{T-1}$ *it corresponds to an eigennumber equal to zero.*

Proof According to the second Eq. (4), for $s = 0$ all exponent degrees obviously turn to zero, so

$$C_0 = \frac{1}{T} \sum_{t=0}^{T-1} A_t$$

Multiply the left and right sides of this equality by $\mathbf{e}^T$

$$\mathbf{e}^T C_0 = \frac{1}{T} \sum_{t=0}^{T-1} \mathbf{e}^T A_t$$

However, according to Lemma 1, all scalar products on the right are single lines

$$\mathbf{e}^T A_t = \mathbf{e}^T$$

From here we get from the previous equality

$$\mathbf{e}^T C_0 = \frac{1}{T} \sum_{t=0}^{T-1} \mathbf{e}^T A_t = \frac{1}{T} \sum_{t=0}^{T-1} \mathbf{e}^T = \mathbf{e}^T$$

On this, the proof of the first part of the lemma is completed.

If $s \neq 0$, then we will have

$$\mathbf{e}^T C_s = \frac{1}{T} \sum_{t=1-T}^{T-1} \mathbf{e}^T A_t \exp\left(-2\pi i s \frac{t}{T}\right) = \frac{1}{T} \sum_{t=0}^{T-1} \mathbf{e}^T \exp\left(-2\pi i s \frac{t}{T}\right)$$
$$= \frac{1}{T} \mathbf{e}^T \underbrace{\sum_{t=1-T}^{T-1} \exp\left(-2\pi i s \frac{t}{T}\right)}_{0} = 0$$

Lemma's proven.

Then, of course, it is necessary to find out what the role of the different C_s matrices in the Fourier decomposition are in terms of their effect on the eigenvalues.

Theorem *Left eigenvector product $A_{T-1}A_{T-2}...A_0$, with the corresponding eigennumber equal to one is defined only by the matrix C_0.*

Proof First, we find the product of vector $\mathbf{e}^T$ on A_{T-1}; based on (4), as well as the approval of Lemma 2, we will have

$$\mathbf{e}^T A_{T-1} = \mathbf{e}^T \sum_{s=0}^{T-1} C_s \exp\left(2\pi i s \frac{T-1}{T}\right) = \mathbf{e}^T C_0 + 0 + \cdots + 0 = \mathbf{e}^T C_0$$

But, we have previously established that, $\mathbf{e}^T A_{T-1} = \mathbf{e}^T$, and therefore we get that

$$\mathbf{e}^T C_0 = \mathbf{e}^T$$

Continuing the multiplication, we will see that the result of these multiplications depends only on the matrix C_0. Proof is complete.

Consider the Fourier transform properties of probability vectors; assume that their dimension is equal to n. To do this, we introduce the so-called spectral matrix (SM):

$$S(\theta) = \frac{1}{\sqrt{n}} \begin{pmatrix} 1 & 1 & 1 & \dots & 1 \\ 1 & \varepsilon^{\theta} & \varepsilon^{2\theta} & \dots & \varepsilon^{(n-1)\theta} \\ 1 & \varepsilon^{2\theta} & \varepsilon^{4\theta} & \dots & \varepsilon^{2(n-1)\theta} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ 1 & \varepsilon^{(n-1)\theta} & \varepsilon^{2(n-1)\theta} & \dots & \varepsilon^{(n-1)^2\theta} \end{pmatrix};$$
$$\varepsilon = \exp\left(-\frac{2\pi i}{n}\right) \tag{6}$$

It is generally believed in these matrices $\theta = \pm 1$, although theoretically this variable can take on any values. It can be called spectral $\theta = \pm 1$ because when multiplying any vector or matrix, it corresponds to their discrete Fourier transform (Ayvazyan 2015).

From (6) it can be seen that this matrix is symmetrical, that is $S^T(\theta) = S(\theta)$.

Let's see what the product of two spectral matrices will be, one of which has $\theta = 1$, and the other $\theta = -1$. Let, during the calculation of this product, the arbitrary k row of the first matrix be multiplied scalarly by l column of the second; we will have:

$$\sum_{s=0}^{n-1} \exp\left(-2\pi i \frac{ks}{n}\right) \cdot \exp\left(2\pi i \frac{ls}{n}\right) = \sum_{s=0}^{n-1} \exp\left(2\pi i \frac{l-k}{n} s\right)$$
$$= n \cdot \delta_{kl} = \begin{cases} n, \ k = l \\ 0, \ k \neq l \end{cases}$$

Therefore,

$$S(1)S(-1) = I = \begin{pmatrix} 1\,0 \ldots 0 \\ 0\,1 \ldots 0 \\ 0\,0 \ldots 0 \\ 0\,0 \ldots 1 \end{pmatrix} \tag{7}$$

Therefore, we make sure that the spectral matrix turns into the inverse of itself, if $|\theta| = 1$, and θ changes the sign:

$$S(-1) = S^{-1}(1)$$

The vector characteristic function (VCF) of the probability vector $\mathbf{p}$ will be called the product

$$\varphi(\theta, \mathbf{p}) = S(\theta)\mathbf{p} \tag{8}$$

At $\theta = \pm 1$ HF performs a discrete Fourier transform (DFT) for probability vectors.

Multiply both parts of equality (4) by $S(\theta)$

$$S(\theta)\mathbf{p}_0 = S(\theta)M_0\mathbf{p}_0 = S(\theta)M_0S^{-1}(\theta) \cdot S(\theta)\mathbf{p}_0,$$

or

$$\begin{aligned} &\varphi(\theta, \mathbf{p}_0) = \mathrm{M}_0(\theta) \cdot \varphi(\theta, \mathbf{p}_0), \\ &\mathrm{M}_0(\theta) = S(\theta)M_0S^{-1}(\theta) \end{aligned} \tag{9}$$

Lemma 3 Let $A_0, \ldots A_{T-1}$—spectral transformations of transition matrices

$$\begin{cases} \mathrm{A}_0(\theta) = S(\theta) A_0 S^{-1}(\theta) \\ \vdots \\ \mathrm{A}_{T-1}(\theta) = S(\theta) A_{T-1} S^{-1}(\theta) \end{cases}$$

Then

$$\begin{cases} \mathrm{M}_0(\theta) = \mathrm{A}_{T-1}(\theta) \cdot \mathrm{A}_{T-2}(\theta) \ldots \mathrm{A}_1(\theta) \cdot \mathrm{A}_0(\theta) \\ \mathrm{M}_1(\theta) = \mathrm{A}_0(\theta) \cdot \mathrm{A}_{T-1}(\theta) \cdot \mathrm{A}_{T-2}(\theta) \ldots \mathrm{A}_1(\theta) \\ \vdots \\ \mathrm{M}_{T-1}(\theta) = \mathrm{A}_{T-2}(\theta) \cdot \ldots \mathrm{A}_0(\theta) \mathrm{A}_{T-1}(\theta) \end{cases} \tag{10}$$

The proof is sufficient for the first equation of the system (4). Multiply both parts of it by spectral matrices. After that, it is easy to make sure that the first equation of the system (8) is reproduced.

4 Conclusion

1. After studying all the processes, the following conclusions can be drawn: With the help of transformations of a special kind, it was possible to reduce the very difficult problem of probabilistic modeling of non-stationary processes to modified stationary problems, the solution of which is much easier.
2. The use of the discrete Fourier transform turned out to be effective for analysis.
3. A number of specific such changes have been clarified within the framework of the task under consideration.

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Correlation of Housing Savings Cooperatives with Cooperative Legislation, Cooperative Principles and Ideology

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Abstract The purpose of the research is to identify the compliance of the activities of housing savings cooperatives with cooperative and civil legislation, cooperative principles and the ideology of the cooperative movement. The work analyses the effectiveness of consumer cooperatives in the field of housing construction and the elimination of housing shortages in the real estate market. Using a wide range of research methods: comparative, logical, specifically historical, statistical, formal-legal and others, the role and significance of the self-organization of citizens in the form of cooperatives in solving the housing issue in the past and present is analyzed. The work concludes that there is increased control by the state over the cash flows of the shareholders of the cooperative, as well as that the cooperative principles are nevertheless not respected and many housing and savings cooperatives created do not meet the criteria of the consumer cooperative, since, often, formally hiding behind the goal of meeting their own housing needs, the organizers of HSCs pursue the goal of profit. Nevertheless, given the importance of the housing issue and the effectiveness of its resolution by existing and existing cooperative organizations, it is necessary to recognize the importance of the cooperative movement in the housing sector of the economy. Since even cooperatives created for profit and thereby violating the principles and ideology of the cooperative movement, as well as civil legislation, significantly improve the housing and, in parallel, the socio-economic situation in our country. In this regard, recommendations are made to classify HSCs as commercial organizations.

Keywords Housing and savings cooperative · Consumer cooperation · Non-profit legal entities · Cooperative movement · Cooperative ideology · Housing issue · Citizens self-organization

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1 Introduction

In the Russian Federation, throughout its history, housing has always stood out among all social issues, since housing is the most important and most valuable matter in the life of every person. Housing Savings Cooperative (HSC) is a type of consumer cooperative that combines the qualities of a financial and housing construction cooperative. After the adoption of the federal law of December 30, 2004 No. 215-FZ "On housing savings cooperatives" the first housing savings cooperatives began to appear since 2005 (Law and "On Housing Savings Cooperatives" 2004). The organization and operation of housing savings cooperatives makes a significant contribution to the formation of private housing stock and the elimination of housing shortages in the real estate market, increases the opportunities of the population to purchase housing, therefore, a study aimed at studying the activities of housing savings cooperatives in the light of relatively recent changes in legislation is very relevant. Also, a study of the correlation of the activities of housing savings cooperatives with cooperative legislation, principles and ideology of the cooperative movement is of particular relevance.

2 Methodology

Using a wide range of research methods: comparative, logical, specifically historical, statistical, formal-legal and others, the role and significance of the self-organization of citizens in the form of cooperatives in solving the housing issue in the past and present is analyzed.

Among the sources used in the process of writing the article, it is necessary to distinguish the following Federal laws: "On housing savings cooperatives" from 30.12.2004 No. 215-FZ (Law and "On Housing Savings Cooperatives" 2004); State Registration of Legal Entities and Individual Entrepreneurs Act No. 129-FZ of 8 August 2001 (Law and "On State Registration of Legal Entities and Individual Entrepreneurs" 2001); "On self-regulatory organizations in the financial market" dated July 13, 2015 No. 223-FZ (Law and "On Self-Regulatory Organizations in the Financial Market" 2015).

The theoretical basis of the study was the works of such authors as: Alchakov and Mishurov (2018), Drobysheva (2017), Emelyanova et al. (2017), Kovaleva et al. (2015), Krylov (2018), Kryukova and Markova (2019), Leontiev and Novikova (2017), Lobanova (2016), Ozerova (2017), Skripnichenko (2016,2019a, b), Shevtsova and Shlekene (2018).

3 Results

Back in the 1920s, in the era of the Soviet Union, associations of citizens began to appear for the construction and subsequent operation of residential buildings. However, the policy of command and administrative management of the economy replaced economic liberties and relaxations of the NEP era, which led to the elimination of such associations of citizens as unacceptable manifestations of private property and their complete prohibition since 1937. Since that time, the entire pre-war and small post-war periods, joint activities of citizens to build private housing were banned. But, already in the post-war years, as a result of a sharp increase in the urban population in our country, the housing issue became acute. In this regard, in 1958, the CPSU Central Committee and Council of Ministers of the USSR allowed the creation of housing construction cooperatives. In order to reduce the cost of housing, sometimes, the shareholders themselves took an active part in the construction of houses. In 1959, the Council of Ministers of the Russian SFSR adopted a resolution "On measures to promote the collective construction of multi-apartment and single-apartment individual residential buildings." The measures taken contributed to the elimination of the housing shortage, however, despite the measures taken, the share of housing construction cooperatives in the Soviet Union was below 10%.

In the early 80s of the twentieth century, the principle of "Every family deserves an apartment" was put at the forefront of our country. In such a way, almost simultaneously, the construction of almost 80 thousand cooperative apartment buildings began in many cities of the Soviet Union, which extremely positively affected the situation with the elimination of housing shortages. Despite the protracted construction, for a large part of the population of our country, the need for housing was satisfied.

Current legislation also provides for the possibility of improving their housing conditions in the form of self-organization of citizens into cooperatives. Until 2004, the leading form of self-organization of citizens who want to improve their housing conditions was a housing and construction cooperative. But this form discredited itself due to the abuse of unscrupulous developers of cooperative legislation and a total violation of the principles and ideology of the cooperative movement. What was the effect of these violations?

Therefore, according to civil law, a housing and construction cooperative is a non-profit legal entity, accordingly, the purpose of this type of cooperative is not to generate profit, but to satisfy housing needs. In Russian realities, everything was upside down, that is, it was not individuals who united and looked for a contractor, a developer to satisfy their housing needs, but on the contrary, the developer attracted citizens' money in order, first of all, to make profit and his own enrichment. In general, this form of activity was quite successful and provided housing for citizens. But as a result of economic instability, crises that periodically take place in our state, and sometimes due to banal greed and bad faith of developers, often, members of cooperatives were left without money and without housing. When social protests on this issue began to take on a massive character, the state could no longer ignore

the serious problems in the housing sector of the economy, in particular related to cooperative housing construction.

As a result of updating the legislation, in order to stabilize the socio-economic situation in the field of housing construction, it was supposed to replace housing and construction cooperatives with housing and savings. But it was decided to abandon the complete replacement in the future, since, despite some overlapping opportunities (for example, housing construction), the functionality and rights of HCC and HSC still differ.

The main legal act regulating the activities of housing enterprises, as already noted, is the Federal Law of 30.12.2004 No. 215-FZ "On Housing Savings Cooperatives." This law regulates the organizational, legal and economic issues of the functioning of the HSC. The law defines the procedure for attracting and distributing contributions from participants in cooperatives. In addition, the law defines the legal guarantees, rights and obligations of participants in HSCs. The law also defines the procedure for the creation, reorganization and liquidation of housing savings cooperatives (Law and "On Housing Savings Cooperatives" 2004).

The housing savings cooperative, according to the current legislation, is a consumer cooperative organized on the basis of a voluntary association of citizens in order to satisfy the participants in the cooperative in housing. The Federal Law "On Housing Savings Cooperatives" emphasizes that HSC is not entitled to carry out any activities that are not provided for by this law.

In recent years, Russians have faced numerous scams and non-fulfillment of obligations in the field of housing construction. Even today in Russia, the concept of "deceived equity holder" is relevant in order to stabilize the situation in the housing sector of the economy and ensure the most important socio-economic needs of citizens for housing, the state has radically revised the legislation on attracting private funds for housing construction. The state has taken special control over activities related to attracting citizens' funds to meet housing needs.

Having reviewed the activities of housing savings cooperatives, conducted a comparative analysis and compared their work with the functioning of housing construction cooperatives, we came to the conclusion that the changes in the legislation affected, first of all, the guarantees of maintaining the monetary investments of shareholders. This, of course, had a positive effect on the socio-economic situation in the housing sector of our country's economy, as there are fewer and fewer deceived equity holders every year. Nevertheless, the ideology and principles of the cooperative movement still, in practice, stand alone and are not correlated with the actual activities of housing and savings cooperatives. Cooperative principles are not respected and many housing and savings cooperatives created do not meet the criteria of a consumer cooperative. Nevertheless, given the importance of the housing issue and the effectiveness of its resolution by cooperative organizations, it is necessary to recognize the importance of the cooperative sector in housing construction, since even cooperatives created for profit and thereby violating the principles and ideology of the cooperative movement, as well as civil legislation, still improve the housing situation in the country and this is certainly a positive result of the reform.

In addition to the above mentioned positive factor, a number of researchers, for example, Kovaleva et al. (2015), highlight other positive aspects in the activities of the housing and communal services. In their opinion, the activities of housing savings cooperatives stimulate the development of the construction industry, other adjacent areas of the economy, which, in turn, leads to a decrease in unemployment in the country, contributes to social and economic stability in our country (Kovaleva et al. 2015).

4 Conclusion

As already noted, since 2005, those wishing to improve their housing conditions through self-organization can join housing and savings cooperatives, and there are strict rules for controlling cash flows designed to improve the housing conditions of shareholders. In particular, the HSC should ensure the possibility of providing and receiving electronic documents in accordance with the established requirements of the Central Bank. The liability of the HSC for its obligations is ensured by all property that belongs to it. HSC membership is possible under similar rules for most cooperatives. Age restrictions—16 years. In accordance with the Charter of the HSC and the current legislation, the cooperative must record its members and reflect in the register basic information about the participants in the cooperative. In turn, cooperative participants should promptly report changes in recorded data.

Unlike other types of cooperatives, the number of HSCs should be 50 or more people. The maximum number of 5000 participants. The registration of cooperative members in the State register is carried out in accordance with Federal Law No. 129-FZ of August 08, 2001 "On State Registration of Legal Entities and Individual Entrepreneurs." In accordance with the same law and the above number of participants in the cooperative, state registration of the housing and savings cooperative is carried out (Law and "On State Registration of Legal Entities and Individual Entrepreneurs" 2001).

As for most legal entities, the reorganization of the housing and savings cooperative is carried out in the form of merger, accession, separation, allocation or transformation. According to article 13, paragraph 2, of the Federal Law "On Housing Savings Cooperatives," the housing and construction cooperative is transformed into a housing cooperative, into a housing cooperative or into a partnership of homeowners.

The legislation also provides for the liquidation of HSCs, both voluntarily and judicially. The Central Bank has the right to appeal to the court with a request to liquidate the housing and communal services. Such an opportunity arises for the Bank of Russia in case of repeated or gross violation of the legislation of the Russian Federation, in particular, the Federal Law "On Housing Savings Cooperatives," Federal Law of July 13, 2015 No. 223-FZ "On Self-Regulatory Organizations in the Financial Market" and other laws. The Liquidation Commission, which acts on behalf of the HSC and represents it in litigation, plays a key role in the liquidation process.

If the HSC is liquidated, all its assets are assessed and, once the debt is satisfied, divided among the HSC participants according to the size of their shares (Law and "On Self-Regulatory Organizations in the Financial Market" 2015).

The register of HSC is carried out according to the rules provided by the Bank of Russia. In accordance with Federal Law No. 215-FZ "On Housing Savings Cooperatives," attracting cash from shareholders, the HSC can use it only for the following purposes: for the purchase of housing; for the construction of houses; HSCs can also borrow funds to achieve the above objectives, but within the limits stipulated by the Federal Law (not more than 40% of the total value of the property of HSCs) (Law and "On Housing Savings Cooperatives" 2004). According to Skripnichenko (2019a, b), to date, far from all opportunities have been used to optimize the activities of housing and communal services, in particular, the author believes that a significant impetus for the development of housing and communal services would be the provision of the right to acquire land at the expense of the cash of the shareholders of the cooperative to carry out the function of developer of apartment buildings (Skripnichenko 2016,2019a, b). In turn, Russian jurisprudence indicates the lack of such rights and opportunities for HSCs.

If, as a result of its activities, the HSC receives additional income, all these funds are accumulated in the so-called HSC reserve fund in accordance with the current legislation, and then divided among the HSC participants according to the size of their shares. The most significant information about the activities of the HSC related to the attraction and use of material assets of shareholders, the HSC is obliged to post freely for consultation. This information should include information on the number of shareholders, the amount of the share contribution to the housing and savings cooperative, debts, costs and other information provided for by decision HSC and FZ No. 215.

In order to meet the objectives of the LNC's activities, the HSC has the right under the current legislation to use the cash of the shareholders of subsidies and subventions, loans and loans, income from the sale and use of housing owned by the HSC. Also, the law does not prohibit donations and other sources not prohibited by law. Therefore, HSC, according to Krylov (2018), have many advantages and can be good alternative to mortgages (Krylov 2018).

Summarizing the above, we can conclude that by updating the legislation in the field of the housing cooperative sector of the economy, the state tightened control over the cash flows of citizen shareholders, thereby protecting and stabilizing the real estate market. However, it can also be concluded that, despite increased state control over the cash flows of cooperative shareholders, cooperative principles are nevertheless not respected and many housing and savings cooperatives created do not meet the criteria of a consumer cooperative, since, often, formally hiding behind the goal of meeting their own housing needs, the organizers of HSCs pursue the goal of profiting. Nevertheless, given the importance of the housing issue and the effectiveness of its resolution by existing and existing cooperative organizations, it is necessary to recognize the importance of the cooperative movement in the housing sector of the economy. Since even cooperatives created for profit and thereby violating the principles and ideology of the cooperative movement, as well as civil legislation,

significantly improve the housing and, in parallel, the socio-economic situation in our country. We see a way out of this situation in order to consider HSCs to be commercial organizations.

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Introduction of Innovative Technologies for Quality Control of Functional Desserts in Consumer Cooperation Organizations

Larisa N. Shubina, Irina A. Derenkova, Anastasia V. Strizhenko, Tatiana V. Yakovleva, and Svetlana V. Belousova

Abstract The paper aims to develop the latest recipes and innovative technologies for quality control of functional desserts in consumer cooperation organizations. Currently, fortification of bakery, flour confectionery, and culinary products with vitamins, proteins, macronutrients, and micronutrients is especially valuable and timely. Moreover, there is a strong trend of increasing consumer demand for various specific desserts. In this regard, it is necessary to expand the range of culinary products, introduce innovative cooking technologies, use vegetable raw materials as functional additives, and implement product quality control systems at enterprises, thereby improving the health and safety of the population. The research has shown that the characteristics of pectin substances in the process of freezing, storage in frozen form, and in the process of defrosting change dramatically. Besides, the authors scientifically substantiate and experimentally prove the expediency and efficiency of using pectin substances of fruits and berries growing in Krasnodar Krai to produce functional desserts. The research results can be used by public catering enterprises of the consumer cooperation system.

Keywords Desserts · Functional raw materials · Quality control · Effectiveness of results · Consumer cooperation

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1 Introduction

For many years, the Krasnodar Cooperative Institute has been cooperating with the Krasnodar Union of Consumer Societies. The cooperation is aimed at the development of human resources, the promotion of collaborative projects, the training

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of employees of public catering and trade enterprises in the courses of additional professional education, the training of teachers, and the practical training of students (Obedkova and Opeikina 2014).

Research activity is a key component of joint work. The formation and competitiveness of any consumer cooperation organization depend on the development of research and technological component based on knowledge (Kovalev and Volkova 2015). In this respect, an institute is the leading supplier of innovative products. Students and teachers of the Krasnodar Cooperative Institute (a branch of the Russian University of Cooperation) intensively work on implementing relevant research topics that are of practical value for enterprises and organizations of consumer cooperation.

Today, research is underway on new types of raw materials that would improve the quality and nutritional value of culinary products, including desserts. Creating fortified culinary and confectionery products, one should properly change their chemical composition to bring it as close as possible to the requirements of the theory of balanced nutrition. At the same time, it is essential to preserve the structure, properties, and quality indicators of products.

Nowadays, when developing and implementing innovative technologies for cooking various types of culinary products, one should preserve their quality and safety. One of the technologies that can be used for this purpose is freezing. This method will diversify the market of semi-finished products and ready-made products and prevent or compensate for the lack of nutrients in the human body (Vasyukova et al. 2006).

2 Methodology

Solving the research tasks, the authors used various methods, such as the method of system and technological analysis, the method of expert assessment, and the methods of risk assessment and analysis (Dunchenko 2018).

To develop recipes and modern technologies for quality control of desserts, the authors applied the following sources:

- Works of Russian scientists;
- Works of international scientists working on creating new modern food products containing pectin in their composition;
- Different information materials;
- Various reference materials.

Assessing the quality of frozen sorbets, the authors adopted generally accepted methods and various modern and innovative methods (Dunchenko 2018).

As a result, the authors developed and scientifically substantiated new recipes for frozen functional desserts.

3 Results

At present, it is vital to use local raw materials when cooking culinary products, including desserts and sorbets. Such relevance is due to the fact that local and wild raw materials contain a balanced amount of macro- and micronutrients, a large amount of vitamins, dietary fiber, and minerals (Rodionova and Dudii 2015).

The authors used only natural ingredients of local raw materials to study the development of functional frozen fruit and berry desserts. Raw materials were selected to meet the preferences of the modern consumer (Myasishcheva 2009).

When cooking functional frozen desserts, the authors applied different local raw materials, such as black currant, apples, cherry, and cherry plum.

In addition to local raw materials, the dessert recipes included generally accepted raw materials. For instance, granulated sugar was used to enhance the taste; apple pectin was used as a stabilizer and functional ingredient (Artemova 2016).

At the first research stage, the authors determined the ratio of local raw materials to the generally accepted ones to obtain desserts that combine the highest functional activity. Table 1 presents the results of this stage.

Ten variants of desserts with different ratios of raw materials in the recipe were developed.

At the next stage, the authors conducted a taste test of the designed desserts. The results of this stage are shown in Table 2.

According to the research results, the best indicators were found in sample 1, sample 3, and sample 5. The recipes of the newly cooked desserts are demonstrated in Table 3.

Before cooking, granulated sugar and pectin were sifted and passed through a magnetic separator. After separation, the prepared raw materials were mixed. To ensure an even distribution of the ingredients, the authors mixed the sugar and pectin in a dry form.

Table 1 The ratio of raw materials in the dessert recipe

Ingredient name	Variant number									
	1	2	3	4	5	6	7	8	9	10
	%	%	%	%	%	%	%	%	%	%
Cherry	40	10	–	–	–	40	–	10	10	10
Apple	10	40	10	–	10	–	40	–	10	–
Black currant	10	–	40	10	10	–	10	40	–	–
Cherry plum	–	10	10	40	–	10	–	–	40	10
Tangerine	–	–	–	10	40	10	10	10	–	40
Sugar	15	15	15	15	15	15	15	15	15	–
Pectin	1	1	1	1	1	1	1	1	1	1
Water	20	20	20	20	20	20	20	20	20	20

Source Compiled by the authors

Table 2 Results of the taste test of the designed desserts

Sample name	Organoleptic properties					
	Color	Consistency	Flavor	Taste	Sweetness	Average score
1	2	3	4	5	6	7
Sample 1	9.9	10.0	9.9	10.0	10.0	9.9
Sample 2	9.5	8.3	9.3	8.7	9.8	9.3
Sample 3	9.7	8.9	8.7	9.4	9.5	9.0
Sample 4	9.0	7.3	8.0	8.3	9.2	8.5
Sample 5	9.2	9.1	9.5	9.3	9.8	9.7
Sample 6	8.1	7.5	8.6	9.2	9.9	8.7
Sample 7	9.3	8.1	8.1	7.4	9.4	8.4
Sample 8	9.6	8.5	9.7	9.3	9.4	9.1
Sample 9	9.9	8.7	8.9	8.3	8.5	9.6
Sample 10	9.8	7.5	9.1	9.4	9.5	9.0

Source Compiled by the authors

Table 3 Recipes for newly cooked desserts

Ingredient name	"Krepysh" (Sample 1)	"Sloyoniy" (Sample 3)	"Mandarinoviy" (Sample 5)
Cherry	300	–	–
Apple	90	90	90
Black currant	90	300	90
Cherry plum	–	90	–
Tangerine	–	–	300
Sugar	85	85	85
Pectin	4.5	4.5	4.5
Water	430.5	430.5	430.5
Total	1,000	1,000	1,000

Source Compiled by the authors

Then, the authors filled the container with cold water with a temperature of 20 °C.

Using a stirrer, the authors made a sugar-pectin mixture. The mixing time was 10 min.

Sugar-pectin syrup was boiled to a 20% sugar concentration and 1% concentration of pectin in the syrup. After boiling, the authors filtered the syrup, cooled it to 0 °C, and mixed it with a fruit and berry base.

Before use, the fruit and berry raw materials were prepared in a certain way. For example, the authors removed the stalks of cherry fruits, washed them, and then removed the defective fruits. Next, the authors rubbed the cherry fruits while removing the seeds. The cherry puree obtained in this process was sent to make a fruit and berry base.

The fruits of tangerines were prepared for production in the following way: they were washed; the skin and fibers were separated and wiped. The resulting puree was passed to make a fruit and berry base.

Apples were washed, defective fruits were removed, as well as the peel, core, and seeds. Before wiping, the apples were blanched. Then, they were rubbed to a condition of puree and passed to make a fruit and berry base.

Currant berries were removed from the stems, washed, and sorted into small berries (up to 5 mm in diameter) before making the fruit and berry base. After sorting and peeling, the berries were rubbed. After rubbing, the pureed berries were placed in polyethylene briquettes weighing 10 kg and frozen (Kvaratskhelia and Rodionova 2015).

The finishing of the fruit and berry base for desserts was carried out with the help of sieves with a cell size of 0.4 mm. After finishing, the base has acquired a finely ground delicate consistency and a homogeneous color. Afterward, the fruit and berry base was left for about 2 h. During this time, the viscosity of the mixture increased, which prevents the formation of large ice crystals during the freezing of the mixture.

Next, the fruit and berry base at a temperature of 4 ± 2 °C was mixed with sugar-pectin syrup and sent for homogenization to increase the whipping of the mixture and improve the structure of the finished sorbets.

After homogenization, the mixture was partially frozen to -3 … -6 °C, the desserts were placed in containers and quickly sent for quenching at -25 °C. Quenching is necessary to prevent possible defects in the structure of the finished desserts. Cooked desserts can be stored for 3 months under strict sanitary conditions at a temperature of -15 … -18 °C.

The development of recipes and technologies for making desserts: "Krepysh," "Sloyeniy," and "Mandarinoviy" served as the research result.

At the next research stage, the authors determined the organoleptic properties of new functional desserts. The results of the studies are shown in Table 4.

At the next stage, the chemical composition and physicochemical parameters were determined for the newly designed desserts. The results of the studies are given in Table 5.

According to the requirements of *GOST R 52349–2005* "*Functional food products*," a product is functional provided that it contains functional ingredients in an amount of at least 15% of the daily needs of the human body. In this case, taking into account the daily consumption of desserts in the amount of 250 g, they can be considered a functional source of pectin and vitamin C.

At the next stage, the authors evaluated the quality and safety of fruit and berry desserts. The assessment was carried out under the requirements of *TR TS 021/2011* "*On food safety*." As a result, the authors found that the newly designed fruit and berry desserts meet the established safety requirements.

The authors also prepared a technical documentation package for new types of functional desserts and assessed the dessert production process for compliance with the Hazard Analysis and Critical Control Points [HACCP] principles (Mayurnikova et al. 2020; Rubina 2011).

Table 4 Organoleptic properties of new functional desserts

Indicator name	Dessert name		
	"Krepysh"	"Sloyeniy"	"Mandarinoviy"
Visual appearance	Visual appearance of the dessert corresponds to the geometry of the dosing device	Visual appearance of the dessert corresponds to the geometry of the dosing device	Visual appearance of the dessert corresponds to the geometry of the dosing device
Taste and flavor	Taste and flavor correspond to the taste and flavor of the ingredients included in the composition;no extraneous tastes and odors	Taste and flavor of black currant prevail; no extraneous tastes and odors	Citrus taste and favor prevail; no extraneous tastes and odors
Structure	Homogeneous; ice crystals and sugar particles are imperceptible	Homogeneous; ice crystals are imperceptible; barely perceptible sugar particles	Homogeneous; ice crystals are imperceptible; barely perceptible sugar particles
Consistency	Dense	Dense	Dense
Color	Red-purple; the color is homogeneous throughout the entire mass of the product	Purple; the color is homogeneous throughout the entire mass of the product	Yellow-orange, the color is homogeneous throughout the entire mass of the product

Source Compiled by the authors

Table 5 Physical and chemical parameters and chemical composition of the designed desserts

Quality indicators	Dessert name		
	"Krepysh"	"Sloyeniy"	"Mandarinoviy"
Mass fraction of dry substances, %	15.0	14.0	13.2
Mass fraction of titrated acids, %	13	1.9	0.7
Protein content, g	1.0	1.3	1.2
Fat content, g	0.3	0.3	0.4
Carbohydrate content, g	30.3	31.9	30.6
Mass fraction of sugar, %	17.2	16.6	20.3
Moisture content, %	84.6	85.6	86.3
Mass fraction of pectin fractions, g	0.72	0.85	0.66
Energy value, kcal/100 g	119.0	126.5	121.0
Mass fraction of vitamin C, mg per 100 g	8.7	12.9	10.8

Source Compiled by the authors

Besides, the pilot-production testing of the developed technological solutions and the assessment of their economic efficiency was carried out.

4 Conclusion

As a result of the analysis of the economic efficiency of the results of the study, the authors found that the introduction of functional fruit and berry sorbet into production will allow one to make a profit of 82,496 thousand rubles. For the first year of operation, the profitability will be 19% with a payback period of 1 year.

The research revealed that the developed functional fruit and berry desserts would be in high demand, as they have a low cost, high quality, and a lot of essential nutrients.

The practical significance of the research is determined by the possibility of implementing the developed solutions at public catering enterprises of the consumer cooperation system.

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Labor Productivity in a Pandemic

Ilya V. Panshin, Olga B. Digilina, and Irina B. Teslenko

Abstract This article analyzes the impact of the pandemic on labor productivity in a digital economy. The pandemic forced employers to transfer some of their employees to remote work, but this process has an ambiguous effect on both labor productivity and the state of the labor market as a whole. The purpose of this article is to answer the question of what is the dynamics of labor productivity in the conditions of "remote employment", and what are the possibilities of employers to influence labor productivity in various sectors of the economy, are both personnel and employers ready for remote work. To answer the questions posed, the authors studied the opinion of heads of organizations and official sources of statistical information.

Keywords ICT · Labor resources · Labor productivity · Information economy · Digitalization · Sistance employment

JEL Codes J24 · O30

1 Introduction

Labor productivity is one of the most important indicators of the efficiency of national production. It is no coincidence that this indicator is used to compare the level of economic development of different countries.

Labor productivity within the framework of individual industries helps to reduce costs and production costs; provides resource savings; initiates an increase in

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workers' wages, thereby increasing the standard of living of the population; ensures the renewal of the material and technical base, forms and methods of organization and production planning; increases the competitiveness of products and the economic sustainability of the enterprise.

National labor productivity increases GNP and national income; it increases the level of well-being of citizens; it creates the basis for financing social programs; it strengthens the economic security of the state. That is why many countries of the world are paying the most serious attention to the implementation of programs aimed at finding reserves for increasing labor productivity.

Scientists and analysts have long been studying the issues of the impact of labor productivity, both at the micro and macro levels. In particular, the literature cites some of the results of recent studies by foreign scientists who have derived the following patterns: an employee's productivity per hour decreases when he works more than 50 h a week, the health of workers determines labor productivity: in 25% of cases, labor productivity is higher among employees who eat healthy food (Bakunin 2020), etc.

For the global economy as a whole, the World Bank's Global Labor Productivity: Trends, Drivers and Strategies notes that it is labor productivity that drives wealth growth in emerging market economies and developing countries. In those countries where there are lower rates of growth in labor productivity, there is also a decline in the standard of living of the population. Reducing extreme poverty from 36 to 10% of the global population between 1990 and 2015 is proof that the poorest countries have been able to increase incomes by increasing labor productivity (World Bank Blogs 2020). The peak in labor productivity growth in the global economy was recorded in 2007, and immediately after the financial crisis of 2008, its growth rates began to decline in emerging market economies and developing countries.

The level of labor productivity is the result of multifactorial influence. Scientists note that labor productivity in advanced and emerging market economies in recent years has been influenced by factors such as: reallocation of resources between sectors depending on their productivity, education level, state of global value chains, degree of economic diversification, urbanization, etc. innovative activities, natural disasters, etc. An unexpected problem at the beginning of 2020 was the unfolding epidemic of coronavirus infection, which can aggravate the already existing decline in labor productivity due to a decrease in retail volumes, investments, suspension of enterprises and organizations, restraining the mobility of the working population, etc.

2 Methodology

In our research, we will rely on the concept of Emerson (1992), who considered labor productivity as a synthesized indicator of the efficiency of all factors involved in the production process (labor, capital, material and intangible resources), and we will note their cumulative contribution to the formation of the value of goods.

Currently, a large number of articles are devoted to the impact of information and communication technologies (ICT) on labor productivity. For example, Edquist and Henrexon (2017) concluded that research and development (R&D) contributes to overall productivity growth much more than investment in ICT.

In the modern world, there is no definite answer about the dynamics of labor productivity, since on the one hand, it is influenced by the digitalization of the economy, on the other hand, it is affected by a pandemic.

In our research, we will rely on studies of labor market institutions, as well as employers' opinions on the total impact of these factors on labor productivity.

3 Results

The impact of the COVID-19 pandemic on all aspects of society has been the subject of research and discussion in the scientific literature. BCG's Global Skills Mismatch 2020 noted that the epidemic exacerbated the pre-existing skills gap (mismatch between the supply and demand of workers' skills in the labor market), which could lead to an increase in global GDP loss from 6 to 11%. Lost GDP on a global scale may amount to 18 trillion US dollars by 2025. In Russia, according to BCG estimates, GDP losses due to the "qualification pit" may amount to 0.6% in the short term. Without active measures, the losses of Russian GDP can increase to 1.8% (Khvostik 2020).

In addition, the pandemic launched a process of structural changes associated with the transition to flexible and remote work formats for personnel and the acceleration of automation processes. Over the next decade, changes will affect up to 1.5 billion jobs: by 2030, robot automation will compromise 12% of existing jobs; about 30% of jobs will require completely new competencies from people.

As for new work formats, according to research company Gartner, after the crisis, about 75% of organizations in the world plan to transfer at least 5% of employees who previously worked in offices to remote work on an ongoing basis. BCG analysis shows that more than 10% of all workers are highly likely to be permanently working remotely, and for office workers this proportion can be as high as 30%.

Scientists are divided over the impact of teleworking on labor productivity. There are those who see in the remote form of work a reserve for increasing labor productivity, and there are those who are pessimistic about the new form of employment. Thus, American researchers believe that working from home can increase productivity: in fact, remote employees work 1.4 days more per month than their office colleagues, which leads to more than three additional weeks of work per year.

According to employees of a number of domestic companies, the efficiency of working remotely during the pandemic has been preserved, and in some divisions it has even increased due to the lack of distractions in each organization and the focus of employees on specific tasks.

A recent experiment by Stanford University scientists showed that working from home over a nine-month period led to a 50% decrease in the rate of employee layoffs.

40% of people feel satisfied with telecommuting because of the convenient and flexible schedule. According to a survey conducted by Deloitte, approximately one in 10 respondents believe that working from home has increased their productivity.

According to Swiss experts, the impact of teleworking on overall productivity varies by sector. Employees working in areas that require a personal presence (administrative support, sales, etc.) may lose some of their efficiency and productivity. And in some professions (for example, in the field of information and communication technologies) productivity as a result of the introduction of remote forms of employment can increase.

The International Labor Organization (ILO) and the "Dublin Foundation (The Dublin Foundation) of the European Union for the improvement of living and working conditions" came to the conclusion back in 2017 that the introduction of remote work formats could lead to a more accurate balance between work and personal life. the most to get more motivated employees. At the same time, remote work is not only not cheaper (some of the overhead and operating costs are borne by employees working at home, the working day is lengthening, it becomes irregular), but also riskier (in terms of non-compliance with information security, discipline, stress situations) than working for a company. In addition, in all countries there is no clear legal basis for telecommuting.

According to analysts, the ideal format that balances the advantages and disadvantages of remote work is two to three days of work from home per week (Vladimirova 2020). As for the opposite, the third part of the Microsoft Work Trend Index report at the annual global conference "Microsoft Ignite 2020" presents the results of a study of the impact of the pandemic on labor productivity. More than 6000 IT specialists and first-line workers participated in it (employees who are responsible for communicating with customers—salespeople, waiters, cashiers, couriers, etc., and who most often do not work in the office, do not have their own worker places) from eight countries.

More than 30% of respondents noted a feeling of burnout at work due to the increase in the length of the working day—they quite often had to work after finishing work, which was not the case before (in Brazil, 44% of respondents faced this, in the USA—31%, in Germany only 10%), and also because of the constant fear of contracting Covid-19, isolation from colleagues, etc. (Gureev 2020).

According to domestic business ombudsmen and entrepreneurs, the transition to a completely remote mode of work will reduce the efficiency of employees.

Experts note that the remote format reduces staff motivation: it relaxes the home environment, there is no personal communication with colleagues and control from the employer, and there is not enough office equipment for remote workers.

Employers point out that with a clear daily work plan—when and what a particular employee should do—you can increase productivity. Without this, at remote work, business processes are slower (Storozheva 2020).

Businesses large and small are very concerned about the impact of COVID-19 on their workforce, productivity and cash flow, according to a new global study by the Association of Certified Public Accountants (ACCA) of 10,000 industry professionals around the world.

The results of the research show that 24% of companies in Russia and 37% in the world have problems with cash receipts. 23% of companies in the Russian Federation admitted that their customers reduced the number of purchases, and 18% either stopped or reduced purchases due to supply chain disruptions, 15% of Russian companies postponed the launch of new products or services. Labor productivity in Russia has decreased by 54%, and in the world as a whole—by 59% (Storozheva 2020).

In general, most researchers are inclined to conclude that a mixed work format in the near future may become the most effective (although opinions continue to differ greatly: for example, Netflix categorically considers telecommuting a bad practice and plans to return employees to the office, and Twitter, on the contrary, is not going to return to old work formats).

According to scientists of the Graduate School of Corporate Governance (GSKU) RANEPA, after the pandemic it is more profitable for the company to return to the traditional organization of work. But during the quarantine measures, a certain experience of working at a remote location was gained. As soon as everything is normalized, a smart employer will begin to analyze this experience and make decisions: if certain categories of workers are identified who can work effectively remotely and who are satisfied with this, their teleworking may become standard. But the transfer of all categories of personnel to remote work in the short term is not reasonable. The pandemic can be viewed as a test of strength and professionalism, the ability to work in a team (Timoshchenko-Borovikova 2020).

The pandemic has left its mark on all aspects of daily life. In particular, it has seriously influenced the regulations of work in the office and at enterprises. According to a study by the consulting company KPMG, more than 50% of companies in Russia are ready to transfer 15–30% of employees to completely remote work. 42% of companies for the same percentage of employees are ready to offer flexible working hours from home and office.

It is noteworthy that after the abolition of the self-isolation regime, top managers were the first to return to the offices. KPMG hypothesizes that in "classic" large companies at a distance, career growth will be possible only with a "human function", and for managers to promote it will be important to work from the office. Probably, we should agree with the opinion that so far the most reasonable approach is the optimal balance of remote and office work with regular care for employees, their moral and physical condition.

Of course, remote work has become a natural response to government quarantine measures in different countries. If this format is more or less entrenched in the practice of companies, then, in the opinion of domestic business ombudsmen and entrepreneurs, other approaches to managing labor productivity will be required. So far, there are no such solutions ready for implementation.

In general, many companies do not plan to implement "indefinite remote control". But as some workers would like to continue working remotely, office jobs will be cut and a co-working system will be introduced. If it is necessary to be present in the office, the employee will be able to work at any free desk.

On the positive side of remote telecommuting, there is a growing trend towards mass adoption of digital skills by workers. In the UK, for example, Burning Glass Technologies estimates that pay rates for jobs requiring digital skills are 29% higher than those where digital skills are not required. According to a joint report by the US Freelancers' Union and Upwork, the number of workers employed in the so-called gig economy by 2027 could grow 1.5 times. At the same time, BCG predicts that as digital technologies spread, the need for a number of positions, especially among administrative personnel, may disappear.

The "qualification hole" deepening due to the influence of the pandemic, a change in professional priorities will require balancing the labor market: reducing the number of unemployed, raising qualifications, redistributing labor force, organizing a system of lifelong learning, etc.

Labor productivity growth issues require solutions in almost all countries of the world. The literature suggests different ways to increase labor productivity, taking into account the impact of the pandemic.

Thus, during a meeting of the President of Russia V. Putin with representatives of various sectors of the economy experiencing the consequences of the spread of a new coronavirus infection, it was noted that elimination of ineffective business processes and the introduction of lean production methods can become serious steps in increasing the efficiency of enterprises (Luchko 2020).

According to foreign researchers, the acceleration of the introduction of advanced technologies, including digital ones, integration into global value chains, lower trade barriers, investment transparency, provision of social protection, the availability of high-quality online school education and training can stimulate the growth of labor productivity, decreasing as a result of the pandemic.

There are no uniform recipes for increasing labor productivity; recommendations should take into account the characteristics of different regions. For example, scientists believe that increasing labor productivity in regions (Europe, Central Asia, Latin America, the Caribbean, the Middle East, North Africa, sub-Saharan Africa), which largely depend on the production of electricity and metals, can be diversification of the economy.

In East Asia and the Pacific, this can be facilitated by the strengthening of intellectual property rights, which would accelerate the introduction of new technologies; in the countries of Europe and Central Asia—reduction of state property; in Latin America and the Caribbean, revising stringent labor laws.

At the enterprise level, during the pandemic, reserves are also being sought to increase labor productivity and, above all, through the use of new digital solutions. Back in 2017, a Microsoft team conducted research on the impact of a digital assistant in helping employees get ready for the start and end of their day. The digital assistant asked questions related to work tasks, emotions, impressions of the past day, and the assessment of their performance on a scale from 1 to 5. Research showed that 6 out of 10 people felt more comfortable when the digital assistant reminded them of the beginning and end of the work day. At the same time, productivity increased by 12–15% on average.

As a result, Microsoft, together with Headspace, developed special tools that will help users improve their productivity through a set of exercises that include meditations and analysis of the past day, as well as help in solving unclosed tasks in Teams and Outlook (Bobylev 2020).

KPMG has developed separate solutions to mitigate risks—recognition of employees in the corporate network using machine learning and face recognition technology (KPMG Smart Observer) and DLP solutions (technologies for preventing leaks of confidential information from an information system), as well as a separate product for organizing remote work—from concept creation and calculation of the potential effect to its implementation.

Therefore, we can conclude that the pandemic has pushed the process of active implementation of gigonomics with new forms of interaction between workers and employers, up to the creation of teams of digital nomads and the uberization of personnel.

In modern conditions, employment services can also contribute to raising labor productivity. The work of employees of employment services with applicants for jobs is becoming more complicated: a person needs to be profiled, competently oriented in terms of applying professional efforts, to form an educational trajectory, to give the opportunity to acquire competencies that suit him and with which a person will find his place in the labor market.

Since it will be necessary to miscalculate the future personnel and competence needs of employers, as close as possible to their requests, employment services will need not just clerks, but analysts who help formulate these needs.

All this also applies to Russia. Until the end of 2024, the national project "Labor productivity and employment support" will be implemented in the country. It is planned to spend 52.1 billion rubles on its implementation. It is aimed at increasing labor productivity, optimizing business processes of enterprises and reducing costs, reducing costs and improving product quality, improving the skills of employees and ensuring effective employment (Sinyagina 2020).

In the current economic conditions, participation in the national project makes it possible to minimize the consequences of the coronavirus economy. A survey conducted by the Federal Centre for Competence in the Sphere of Labor Productivity at the Enterprises of the Rostov Region showed the following: almost all top managers of companies participating in the national project consider measures to increase efficiency in demand during the economic crisis, 88% of respondents noted that the introduction of lean production tools will help companies maintain their market share. In addition, those companies that even before the crisis began to take measures to increase labor productivity can now quickly restructure production without incurring serious losses.

In order to collect and replicate the best Russian and international practices in the field of increasing labor productivity in the Russian Federation, it is envisaged to create a national platform "Digital Productivity Technologies". Best practices are collected by the Federal Competence Center (FCC). Since 2017, he has also been implementing Lean practices in businesses. FCC employees work for six months at each enterprise. They are perfecting the selected site and training staff to further

replicate this experience and develop a culture of continuous improvement in the enterprise.

1548 enterprises have already become participants in the national project, 1150 of them are enterprises in manufacturing. 557 companies from 50 constituent entities of the Russian Federation receive the support of FCC experts.

In the future, at least 10 thousand enterprises in 85 constituent entities of Russia will be involved in the project. 79.5 thousand employees of the companies will be trained in lean manufacturing tools.

According to tax reports for 2018, the enterprises participating in the project, which received targeted support from the FCC, were able to increase their total value added by 3.193 billion rubles compared to the base year 2017 (+17% compared to 2017). The volume of payments to the budgets for income tax and social funds increased by 567 million and 459 million rubles, respectively. The enterprises released another 4 billion rubles from circulating funds for investment and production development. The total costs of the FCC in 2018 amounted to 267 million rubles.

4 Conclusion

In conclusion, it should be said that maintaining the achieved level of labor productivity and its growth is a difficult problem for all countries. To solve it, the development and application of a set of measures is required, since various factors can cause a decrease in labor productivity. In 2020, the coronavirus pandemic was added to them.

Serious changes have taken place in the labor market due to the introduction of quarantine measures. Remote work is one of these changes. It is still necessary to determine the role of the remote employment format in the dynamics of labor productivity, comparing the available data for 2019 with the results of 2020. But in any case, in order for this format and other new forms of employment to give a positive result, it is necessary to develop and implement new methods of management and organization of labor at enterprises. Moreover, it is predicted that by the end of 2021, from 25 to 30% of the workforce will work from home several days a week. Apparently, a mixed format of work may soon become standard.

There is no doubt that further digitalization and automation of production, the rejection of unproductive business processes will become important steps towards increasing labor productivity.

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Development of Methods for Assessing Investment Potential

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Abstract Investment activities of Russian companies are exposed to constant risks due to economic instability, inflation, foreign economic factors and insufficient own funds. As part of the company's business processes, investment activities also require new approaches in the context of increasingly updated innovative processes. The article considers approaches to the evaluation of investment projects and investment policy in general. The need to use heuristic methods in evaluating the effectiveness of projects is considered. The procedure for evaluation of the company's investment activity effectiveness is proposed.

Keywords Investments · Business process · Investment activities · Investment evaluation · Investment efficiency

JEL Codes M41 · M21

1 Introduction

Today, given the current instability of the economic situation, the investment process depends primarily on the investment strategies applied by the company's management, which can provide competitive advantages in both the domestic and foreign markets. The world practice and experience of large multinational companies has shown that it is possible to gain significant advantages in the market and retain large

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markets and even entire industries only by applying large investments in innovative development, in technological development, etc.

Companies focus their overall strategy on sustainable development, stable growth and rational use of resources. Therefore, the investment development of the company should be aimed at finding and applying the most effective investment directions and methods, as well as applying investment management methods in a strategic aspect.

The study of investment strategies and methods for assessing investments and their characteristics is one of the most important areas of work of the company's management, and is also a constant subject of study for modern scientists and leading economists.

The aim of the study is to identify features of information generation on reliability and attractiveness of investment projects in conditions of unstable economic situation.

2 Methodology

In the process of research, systematization and evaluation of the received information, general scientific methods were used: collection and processing of information, comparison, analogies, generalization, as well as logical methods. The theoretical basis of the study was the works and publications of domestic scientists who made a significant contribution to the study of the problems of investment policy formation. Data from analytical reports, information and reference materials from analytical agencies, research by international companies, regulatory acts of the Russian Federation, and Internet materials were also used.

3 Results

The success of the company depends on a well-constructed development strategy aimed at expanding activities and strengthening competitiveness by improving the quality of the goods (services) offered. In order to expand their operations, companies need to look for additional capital flows, one form of which is foreign investment. However, now business has to develop in difficult conditions. Russian corporations were under the influence of a number of negative factors. On the one hand, these are sanctions imposed on a number of domestic companies, on the other hand, an economic crisis aggravated by recent events related to the pandemic. These developments have led to a reduction in a number of investment programmes.

According to the Center for Market Studies of the Institute of Statistical Research and Knowledge Economics, in 2019 there was a significant decrease in the indices of investment activity and investment potential of Russian industrial enterprises, while the latter fell to the level of crisis 2014 from 101.1% in 2018 to 98.8% in 2019 (National Research University "Higher School of Economics" 2020). At the same

time, there is an increased pressure of limiting factors at enterprises investing in fixed assets (Lithi Tsentr 2020).

The fidelity of these indicators is confirmed by the fact that the key indicator of Federal State Statistics Service's investment activity is "investment in fixed assets," which also showed a decrease dynamics of 2.6 p.p. Such dynamics show a decrease in business activity with a subsequent decrease in investment.

It is worth noting that in domestic production companies there is still a tendency to invest in fixed assets in order to increase production efficiency.

Economists and project managers Golovetsky et al. (2020), Chebotarev (2018), use two approaches to determining efficiency:

- economic (costly)—efficiency is determined by the cost-profit ratio;
- management (target)—the degree of achievement of the planned indicators is evaluated and deviations from them are analyzed.

When choosing an investment program, companies are formed on the basis of strategic priorities, microeconomic and macroeconomic priorities and integration of the company's assets (Bodrova et al. 2021; Darinskaya et al. 2021). Of great importance is the flexibility of investment programs, which is determined by the effectiveness of managing the investment portfolio and assessing the effectiveness of investment projects, the degree of readiness of projects for implementation and their impact on cash flows. All these prerequisites contribute to operational management under the influence of a dynamically changing external environment and campaign objectives.

In order to improve the efficiency of the company's investment management system, it is advisable to divide the investment process into a number of stages, which include the possibility of evaluating and monitoring their implementation. In modern conditions, it is advisable to distinguish the following sequence of the investment program:

- Initiating an investment project;
- Examination and preliminary assessment of the project effectiveness;
- Project approval and preparation of relevant technical documentation;
- Monitoring of investment projects.

The investment management scheme is shown in Fig. 1.

The company's investment process is closely interlinked with almost all of the company's business processes: planning and budgeting, financial and management accounting, reporting and management.

The approach to the implementation of the investment project should be based on the formation of the cost and efficiency of investments, namely, the increase in NPV (Net Present Value), IRR (Internal Rate of Return), PI (Profitability Index), DPP (Discounted Payback Period). In addition to the traditional indicators for assessing the investment attractiveness of projects, a number of companies now turn to business performance estimates and adapt them to analyze the effectiveness of an investment strategy: for example, using the Value Based Management (VBM) value creation model. Using the method of economically added value in the evaluation of investment

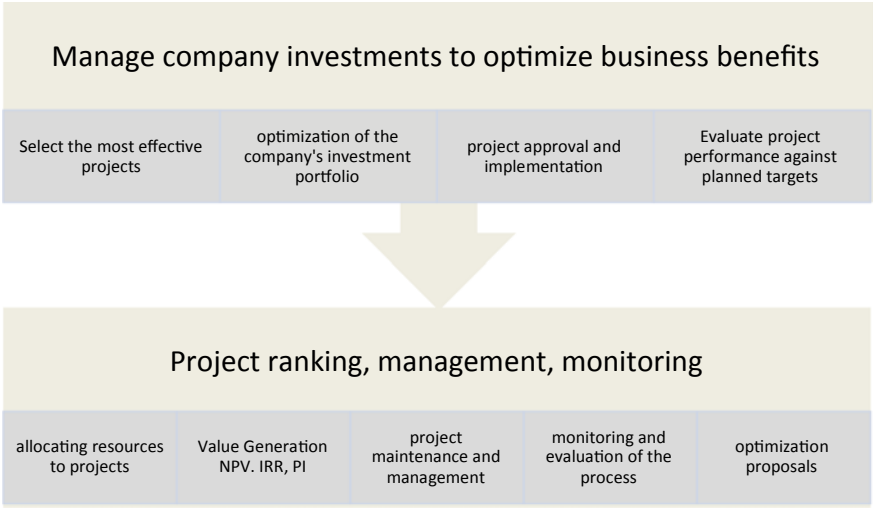

Fig. 1 Investment project management. *Source* Compiled by the authors

projects, it is possible to identify the most profitable areas of activity and "reject" inefficient projects in which the costs of their implementation are only slightly overlapped with profitability, or exceed it.

Given the expanding capabilities of the company, the list of applied methods, indicators of strategies will constantly expand. Therefore, the formation of a basic scorecard takes on great importance for each company. Thus, a methodology for optimizing the valuation of investment projects can be formed:

- formation of a system of indicators characterizing the most significant aspects of investment activity;
- ranking by significance;
- a set of selected indicators into a single system that comprehensively reflects the effectiveness of the investment project;
- identification of investment efficiency improvement reserves.

When using a set of calculated and heuristic methods of evaluation, the construction of a normative system of indicators, which are a reference assessment of the state of object dynamics, will have the greatest effect. It is best to distribute all indicators according to their growth rates and to match them according to their rank. This will make it possible to compare the real dynamics of the indicator with the reference one. For example, for many companies, the following interdependence of investment performance will be relevant:

$$\text{RDigr} > \text{GRiipe} > \text{GRIipc} > \text{GRfi}, \tag{1}$$

RDigr R&D investment growth rate;

GRIipe growth rate of investments in increasing production efficiency (automation or mechanization of the already existing production process, energy saving, etc.);
GRIipc growth rate of investments in increasing production capacity (increasing or expanding the range of products, increasing jobs);
GRfi growth rate of financial investments.

The growth rate of investments in R&D should be highest due to the fact that advanced technologies and innovative development are the basis for future competitiveness and efficiency of the company.

Investment in production efficiency is intensive and a basis for progressive development. Investments in increasing production capacity are significant for maintaining the business activity of the company. At the same time, the growth of investment of an intensive nature among dynamically developing companies should exceed investment in extensive development. Investments in the financial market should take place on a residual basis and therefore will be the smallest and will be made if, after investment in core activities, the amounts of sources of financing remain (Table 1).

The dependence described above is rather a reference character, since companies of different industry affiliation have a significant number of business processes interconnected with investment activities and the number of indicators can increase several times. The main essence of constructing a regulatory system of indicators in investment activity is that the growth rate of investment activity indicators is ranked and compared with a reference sequence, and based on these initial data, it is possible to evaluate the overall efficiency of the company's investment activity using statistical methods.

Table 1 Investment performance indicators

Indicator name	Key figure calculation	Characteristic of the indicator
Spearman rank correlation coefficient	$Kotkl = 1 - \frac{6\sum_{s=1}^{n} Ys^2}{n(n^2-1)}$	The key figure takes into account the deviations between the actual and reference key figures (Ys) and correlates with the total number of key figures (n)
Kendall rank correlation coefficient	$Kinv = 1 - \frac{4\sum_{s=1}^{n} Ms}{n(n-1)}$	It shows the deviation between the actual and reference values if the actual value is higher than the reference value (Ms). If the reference value is higher than the actual value = 0
Investment performance ratio	$Kei = \frac{(1+Kotkl)*(1+Kinv)}{4}$	It represents the geometric mean of the rank correlation coefficients and shows the efficiency of the implemented investment activity

Source Compiled by the authors

In the studies of domestic scientists dealing with the problems of investment activities Verkhovtsev and Grebenik (Verkhovtseva and Grebenik 2016), Veselovsky et al. (2017), Sergeyev (2015), including in the context of a protracted economic crisis and an increasing number of sanctions imposed on Russian companies, there are a significant number of methods for determining the investment attractiveness of both the company as a whole and individual projects. However, at present there is no single methodological basis for assessing investment activities, there are no single principles for assessing, common approaches to interpreting indicators, common indicators.

Currently, modeling methods have become widely used in Russian companies, preference is given to methods for analyzing "scenarios" of the development of the situation and the influence of factors on the assessment of investments. To assess investment activities, it is advisable to use the principles: a systematic approach to assessing and integrating indicators, multi-directionality of indicators, the performance principle.

4 Conclusion

The development of investment policy is an essential element of the company's development especially in the long term. Investments based on long-term strategies should be based on an assessment of the most effective directions of implementation, adjusted at various stages of decision-making, and take into account the risks of a changing external environment. Thus, a properly selected assessment of investment activity in the future will significantly increase the effectiveness of the company as a whole.

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Innovative Activity of Enterprises and Directions of Its Stimulation

Mariya V. Myagkova, Tatyana E. Shilkina, Ekaterina V. Prutskova, and Olga V. Knyazeva

Abstract Currently, the active use of innovation in the activities of enterprises through the use of modern ideas and developments is the basis for the development of economic entities. Given the development of the market economy in the Russian Federation, it is necessary to increase the role of technological development of enterprises, since the timely updating of technologies used in production provides the products sold with competitive qualities and advantages. Increasing the innovative activity of domestic enterprises will ensure high and stable rates of economic growth, solve certain social and environmental problems, increase the competitiveness of the national economy and the country's export potential, which, in turn, will guarantee its economic security and a worthy place in the global world community. The purpose of the research is to analyze the innovative development of enterprises and assess the innovative potential of the Russian Federation to form directions for stimulating the innovative activity of economic entities. In order to reveal the essence of innovative development and substantiate its relevance, the scientific works of domestic scientists and specialists were used. Methods of generalization, comparison, analysis and synthesis were used to analyze the innovation activities of enterprises. The result of the research is an analysis of the innovative activity of enterprises and the innovative potential of the Russian Federation and identified problems that hinder the innovative activity of economic entities. According to the results of the study, the functioning of cluster systems based on the interaction of science, commercial structures, state structures and investment organizations is justified.

Keywords Innovation development · Innovation potential · Innovative activity · Stimulation of innovation activity · Cluster system

JEL Codes D24 · D61 · D51 · E44 · O32 · O38

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1 Introduction

A feature of the development of enterprises in modern conditions is the transition to innovative economic systems. Global trends in innovative development are characterized by structural restructuring of the economy based on the penetration of information and communication technologies into all spheres of economic activity (Volkova 2020). An important task in the Russian Federation at present should be a deep adjustment of the economy, by ensuring a growing level of scientific and technological progress, as the main factor in increasing the innovative activity of domestic enterprises.

The purpose of the research is to analyze the innovative development of enterprises and assess the innovative potential of the Russian Federation to form strategic directions aimed at increasing the innovative activity of economic entities.

The achievement of the above goal required solving the range of tasks related to the analysis of the innovation activity of enterprises in the Russian Federation, identifying problems in the processes of their innovative development and determining the directions for stimulating innovation activity.

2 Methodology

The essence of the innovative development of enterprises is reflected in the works of Volkova (2020), Golikova (2020), Kalashnikov (2020). A significant number of studies address issues of relevance and necessity of innovation activity (Zaitsev 2019; Zubenkov 2020; Sheina 2020, etc.). Problems of formation of innovative economy are investigated in the works of Zabashtansky et al. (2020), Ilyina et al. (2020), Myagkova et al. (2020) and others.

Data from the Federal State Statistics Service (Federal State Statistics Service 2020) were used to assess the innovation activity of enterprises and the level of their innovative development. The article was prepared on the basis of the following general scientific methods—generalization, comparison, analysis and synthesis.

This methodological approach made it possible to systematize the prepared material, to give a quantitative assessment of the innovative development of enterprises, to form managerial decisions to stimulate the innovation activities of economic entities.

3 Results

The role of innovation in the development of countries and regions cannot be overemphasized in view of the major growth in gross national product generated by innovation (Carrot and Stepanova 2020).

In the context of globalization, faster business processes, increasing demands from a rapidly changing market, the competitiveness of organizations increasingly depends on their rapid adaptation to the changes that are taking place (Myagkova et al. 2020). Innovation processes in the domestic economy are characterized as unsustainable and lacking clear long-term incentives for enterprise innovation. In this context, there is a need to identify key challenges to the development of innovation in domestic enterprises.

Table 1 presents the analysis of innovative products in the Russian Federation in 2015–2019.

The total volume of shipped goods of our own production, performed works and services on our own from 2015 to 2019 increased by 46728.9 billion rubles. The production of innovative goods, works and services in 2019 compared to 2015 increased by 1020.0 billion rubles. or by 26.5%.

It should be noted the negative dynamics of the share of innovative products in their total value from 8.44% in 2015 to 5.27% in 2019 or by 3.17 percentage points.

We will analyze the level of innovative activity of enterprises in the Russian Federation in 2015–2019, which is presented in Fig. 1.

This figure is calculated as the ratio of the number of organizations engaged in innovation to the total number of organizations (Electronic legal and regulatory documentation fund 2020). It is worth noting the ambiguous dynamics of this indicator

Table 1 Analysis of innovative products in the Russian Federation in 2015–2019

Indicator	2015	2016	2017	2018	2019	2019 deviation to 2015
Shipped goods of our own production, performed works and services on our own, total, billion rubles	45525.1	51316.3	57611.1	68982.3	92254.0	+46728.9
– including innovative goods, works, services, billion rubles	3843.4	4364.3	4167.0	4516.3	4863.4	+1020.0
Share of innovative goods, works, services in the total volume of shipped goods of own production, performed works and services, %	8.44	8.50	7.23	6.55	5.27	−3.17

Source Federal State Statistics Service (2020)

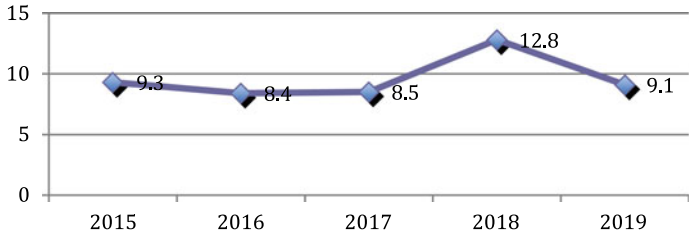

Fig. 1 Level of innovative activity of organizations in the Russian Federation in 2015–2019, %. *Source* Federal State Statistics Service (2020)

during the analyzed period. The largest indicator of innovative activity reached in 2018 and amounted to 12.8%, the smallest value of the indicator is typical for 2016—8.4%. Positive dynamics are characteristic of the level of innovative activity from 2016 to 2018, then innovative activity is declining and by the end of 2019 reaches a level of 9.1%.

Figure 2 shows the analysis of the costs of organizations for innovation activities in the Russian Federation in 2015–2019.

This indicator represents the actual costs associated with various types of innovation. The dynamics of the cost of innovative activities of organizations in the Russian Federation throughout the study period is positive. Therefore, their size increased from 1203.6 billion rubles in 2015 to 1954.1 billion rubles in 2019 or 62.3%.

Innovation and research are part of the digital economy and ensure product quality, production efficiency and process modernity (Zaitsev and Gurtskaya 2019). Based on the indicators of patent statistics, Table 2 presents an analysis of the innovative potential of the Russian Federation in 2015–2019.

According to the submitted data in the Russian Federation for 2019, 52,567 applications were submitted for state registration of inventions, utility models and industrial designs, which is 9785 units or 15.7% less compared to 2015. The greatest activity is observed in the field of patenting industrial samples. At the end of 2019, a total of 48,251 patents were issued, which is 922 units or 1.9% less than the 2015 value. In total, at the end of the period under review, 35,1602 patents were valid,

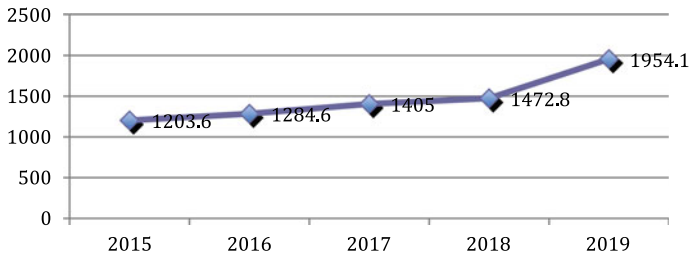

Fig. 2 Innovation costs of organizations in the Russian Federation in 2015–2019, RUB bln. *Source* Federal State Statistics Service (2020)

Table 2 Indicators of innovation potential of the Russian Federation in 2015–2019, units

Indicator	2015	2016	2017	2018	2019	2019 deviation by 2015
Receipt of patent applications for patents	62352	58163	53584	53612	52567	– 9785
Patents issued	49173	46866	48367	51946	48251	−922
Number of active patents	305119	314615	326624	341662	351602	+46483
Advanced manufacturing technologies developed	1398	1534	1402	1565	1620	+222
Use of intellectual property	29143	32756	32997	39837	47238	+18095

Source Federal State Statistics Service (2020)

that is, it exceeds the number of patents in 2015 by 46,483 units or by 15.2%. In 2019, compared to 2015, the number of developed advanced production technologies increased by 222 units or by 115.9%.

The indicator of the use of intellectual property objects serves as a source of information on the state of innovation in terms of the use of intellectual property objects. It should be noted that during the study period there was an increase in the used intellectual property objects by 18,095 units. If we consider the use of intellectual property objects in the context of their types, then the largest number falls on inventions and programs for computers.

As the main problems hindering the innovative activity of economic entities, one can identify:

- Lack of an effective mechanism to stimulate innovative enterprise development;
- Low level of investment in innovative activities due to risky investments in knowledge-intensive industries and technologies;
- Lack of qualified personnel involved in research and development activities;
- Lack of favorable conditions for innovation activities in enterprises, the need for systematic technological re-equipment of production with modern high-tech equipment;
- Weak interaction between the participants of innovation activities, lack of effective organizational and economic mechanism of management.

The identified problems determine the need to prevent processes that slow down the development of innovation in the economy. The creation of such conditions for the functioning of the economy, under which maximum growth of income and profit is ensured, is the content and goal of the innovation strategy of sustainable development of production in the enterprise (Kasyanov and Prusov 2020).

The development of innovation management systems of domestic enterprises is directly influenced by the system of state support for innovation (Ustinova and Ustinov 2018). Only due to the joint actions of the state and enterprises can the effective innovative development of modern economic entities be carried out.

Currently, the development and support of cluster systems is becoming an urgent element of the socio-economic and innovative development of the country. The source of innovation and technological development within cluster systems is the interaction of the following elements:

- the science presented by higher education institutions, branch research institutes, research and experimental centres;
- commercial entities represented by modernized and multidisciplinary enterprises;
- state structures interested in the implementation of innovative projects;
- financial credit and investment organizations that ensure the availability of financial resources.

The proposed distribution of tasks and functions within the cluster system of innovative development is presented in Table 3.

The formation of innovative clusters creates the basis of strategic planning for the growth and development of competitiveness of many Russian regions (Golikova 2020). Enhancing competitiveness and innovation through cluster initiatives is becoming a core element of most countries' innovative development strategies. The advantages of using clusters are:

Table 3 Distribution of tasks and functions of innovative development within the cluster system

Task	Functions	Executor
Research activities	– Identification of promising market segments – rationale and initiation of innovation activities – Research and development activities – Development of business plans for creation and implementation of innovative products	Higher education institutions, research institutes, pilot centers
Production activity	– Provision of production sites – Provision of highly qualified personnel – Organize and promote sales of innovative products	Commercial structures
Financial activities	– Provision of financial resources – Investment risk assessments	Financial, credit and investment institutions
Regulatory activities	– Regulation of participants in the innovation cluster system – Provision of necessary information, assistance in the organization of negotiations – Assistance in obtaining financing, provision of guarantees	State structures

Source Compiled and built by the author

1. accumulation of scientific and technical, intellectual, financial, natural and other resources to solve production problems, including the production of competitive innovative products;
2. obtaining a synergistic effect when combining not competing, but interacting organizations, resources are concentrated to achieve joint commercial goals;
3. state support for clusters whose areas of activity correspond to national interests while increasing the competitiveness of the country and the level of its innovative development.

4 Conclusion

The research identified the role of innovative development as an important competitive advantage of modern enterprise activities. The innovative development of enterprises at the present stage is an integral part of their main activity and leads to an increase in the level of competitiveness of their products and enterprises as a whole, which indicates an increase in the efficiency of their production activities (Lazarev and Pirogova 2020).

In order to analyze the innovative potential of economic entities in the Russian Federation, a list of necessary indicators has been formed: the volume of innovative products, the level of innovative activity of enterprises, the magnitude of the costs of innovative activities, and the indicators of patent statistics.

The analysis revealed the problems of innovative activity of domestic enterprises, which determine the need to prevent processes that slow down the development of innovation in the economy. The final stage of the study was proposals for the development and support of cluster systems in which research, production, financial and regulatory activities interact.

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Creation of an Optimization Mechanism to Increase the Economic Potential of an Enterprise

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Abstract The economic potential of economic entities is characterized by many parameters that depend and are formed under the influence of environmental factors, financial condition, and business results. The announced parameters are dynamic, changing they also affect the economic potential and its individual elements, which ultimately determines the capabilities of the enterprise, the level of its economic growth and development, the implementation of the goals and objectives. Enterprise development management requires informed decisions based on economic capacity assessments. Where opportunities are limited, the choice of development priorities requires an integrated assessment of the key parameters of economic potential. The above problems update the study of the basis of the optimization mechanism to increase the economic potential of the enterprise to increase its efficiency. An important importance in ensuring economic security and the formation of an optimization mechanism to increase the economic potential of the enterprise is assigned to accounting and analytical support. The information security of the enterprise in modern economic conditions also affects the state of the economic security system. The process of ensuring economic security is influenced by flows of accounting and analytical information, which identify deviations from the planned results and, accordingly, the earlier such deviations are detected, the more likely it is to return effective business activities to the right direction.

Keywords Economic potential · Economic security · Risks · Optimization mechanism · Sub-potential · Financial strategy · Economic potential management

JEL Codes D21

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1 Introduction

Financial sustainability and economic security are almost inseparable. In modern economic conditions, when almost any business is exposed to all kinds of threats, even sometimes not directly related to the sphere of activity of the economic entity, which confirmed the consequences of the global pandemic, it is necessary to be fully armed with economic security. The margin of financial safety should be a kind of shield against unforeseen threats and unpredictable risks.

Everyone is well aware that economic security requires a kind of "safety bag", namely, financial resources that can last in times of acute crisis.

Financial sustainability is directly dependent on the availability of resources, financial results and good governance.

It is possible to overcome the aggressive impact of external threats through a financially stable internal environment and the ability to generate profits.

Regular financial analysis will monitor the presence of internal threats and predict various scenarios of the situation.

Flexible diversification of financial and productive activities has a major impact on financial sustainability and economic security.

The optimization mechanism for increasing the economic potential of an enterprise is an enterprise management system that needs to be studied through horizontal analysis of the relationship of structured sub-capabilities.

The most important importance in the system of sub-capabilities belongs to the financial criteria that form the financial sub-potential and the financial strategy for the development of the enterprise as a whole. Indicators of the financial stability of the enterprise, namely the ratios of autonomy, financial independence, maneuverability of equity, etc., reflect the ability of the enterprise to effectively use its own and borrowed capital, its net current assets, which allow us to conclude about financial, investment opportunities, creditworthiness of the enterprise and in general about the investment attractiveness and economic potential of the enterprise.

2 Materials and Methods

The management of the financial resources of the enterprise must always be guided by the conditions of optimality of the ratio of own and borrowed funds, that is, the sources of financing must be monitored through the monitoring of changes in financial sustainability ratios. The excess in the ratio of own and borrowed funds in one source or another characterizes the financing strategy as aggressive, conservative or moderate.

Theoretical and applied questions on the problem studied in this article are disclosed in the works of Astrakhantseva (2018), Zhilina et al. (2018, 2020), Minaeva (2016), Court (2016), Ponomareva et al. (2019), Pshenichnikov (2016), Sabitova (2013) and Shumeyko et al. (2019).

When developing an optimization mechanism for managing economic potential, the main in the current conditions for the development of the region's economy should focus on strengthening financial sustainability and increasing the economic potential of enterprises.

An enterprise is always exposed to risk and uncertainty, especially when it comes to the impact of external factors on its activities. This situation forces the management of the enterprise to strengthen the management of the enterprise in order to minimize threats and risks to the environment.

Therefore, the process of continuous development and moving forward must be seen as the sustainability of the enterprise, during which there is a change in both the organizational structure of the enterprise management and its financial system. Further positive development of the enterprise leads to more complex organizational relations, i.e. the emergence of additional structures and, as a result, more stable structural relations.

Modern owners of enterprises at the current stage are interested not so much in the growth of financial indicators of the enterprise's activity, but in increasing the cost of the enterprise over time. In this regard, it is advisable to use the model of maximizing the market value of the enterprise when developing and applying the model of optimization of economic potential management. It is based on the observance of the interests of the owners of the enterprise, and the observance of the principle of multiplier, where in the numerator—the market value of the enterprise (or the price of its share), and in the denominator—the amount of net assets of the same enterprise. The indicator of the market value of the enterprise is broader, relative to other indicators of the enterprise. It includes such indicators as the net cash income of the enterprise, projected cash flows of the enterprise, changes in capital (both equity and borrowed), capitalization ratios, discounts, etc., by choosing the optimal discount rate. This indicator allows you to measure the activity of an enterprise both from the position of its financial activity and from the position of making management decisions.

This model is not devoid of shortcomings, as well as a number of other proposed models, but one of the advantages of the proposed model is that the group of indicators of the components of this model allows for a detailed analysis of the enterprise's activities using financial stability ratios, determine the degree of influence of various factors on the enterprise's development strategy, namely its financial activity (Astrakhantseva 2016, p. 67). Most often, financial sustainability refers to the optimal ratio of the company's own and attracted sources of financing, namely the independence and self-financing of the enterprise. Despite the fact that almost all large enterprises attract borrowed capital for activities and this process is normal.

According to the study, a financial and sustainable enterprise is recognized as an enterprise that has the largest share of its own sources of financing its own activities in the capital structure. Such a capital structure is the most attractive for both investors and creditors when deciding to place funds in the activities of an enterprise.

In order to maintain and extend the period in which the enterprise is in financial and sustainable situation, it is necessary to adhere to a policy of balance between the investment, operational and financial activities of the enterprise, that is, all financial

flows in the enterprise should be managed with clear observance of the effective results of the financial and strategic analysis of the enterprise (Fig. 1).

The policy of management of financial flows of the enterprise should be implemented in two areas:

- assessment of internal sources of growth of financial flows of the enterprise, namely assessment and monitoring of personnel, property complex, intangible assets, intellectual potential, etc.;
- evaluation of external sources of growth of financial flows of the enterprise, namely attractiveness of the investment environment, fulfillment of the criteria of solvency for attracting loans and loans.

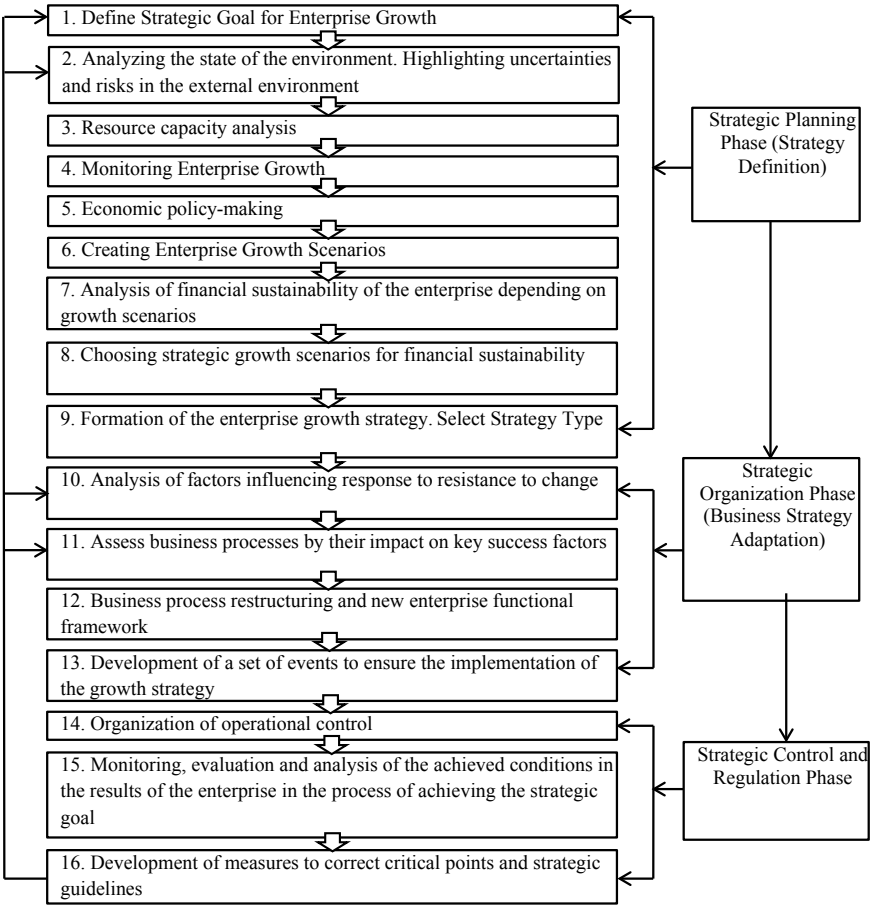

Fig. 1 Stages and phases of enterprise economic capacity management. *Source* Compiled by the authors

The financial flow management policy according to the first direction forms a group of indicators that allow you to determine the goals, tasks, main priority areas of the enterprise's activities, in the field of improving the development of personnel policy, increasing the production potential of the enterprise, marketing policy in order to attract investment and credit resources. Effective management of indicators included in the first direction allows more detailed compliance with the level of solvency, financial stability and business activity of the enterprise. At the same time, a positive image of the enterprise is formed, which allows attracting the largest investors and creditors for the development of the enterprise, from this follows the implementation of the second direction of managing the financial flows of the enterprise.

3 Results and Discussion

Such a grouping of basic financial indicators makes it possible to characterize the reaction of the financial and economic system of the enterprise to external and internal contradictions. The adequacy of the enterprise response as a system to stimuli determines the stability of the system as a whole and its economic potential.

When combining sub-potential elements, a synergistic effect is formed, as a result of which each unit increases the overall result several times. Thus, by managing individual elements of economic potential, it is possible to ensure its dynamic growth.

In order to create an optimization mechanism system for increasing the economic potential of PJSC "Nizhnekamskshina", it is recommended to establish an internal management standard—the "Scenario planning system for the financial and economic activities of PJSC "Nizhnekamskshina" for a three-year period."

The proposed standard contains a clear regulation for the formation of a three-year forecast of the financial and economic activity of the enterprise, which is based on the company's development strategy, taking into account changes in price conditions in industry markets, trends in macroeconomic indicators. As a result of the implementation of the standard, quantitative indicators are formed that characterize the value of the total economic potential calculated on the basis of the optimal economic potential model.

The main purpose of this standard is to establish a system of effective management of financial performance of the enterprise based on the implementation of the optimal economic potential model.

Based on the objective, the following objectives of the proposed standard are formed:

1. In order to ensure the stability of the enterprise's development in the forecast three-year period of financial and economic activity, investment program and budget of PJSC "Nizhnekamskshina";
2. Scenario approach of economic situation development based on improvement of forecasting accuracy;

3. Development of a system of balanced indicators of the enterprise's activity, namely the optimal ratio of future costs depending on the expected income and priorities of the company's socio-economic policy in the forecast period.
4. The establishment of a system of limits regulated in local acts of the company will streamline the financial strategy of PJSC "Nizhnekamskshina", make it formalized and concrete.

The introduction of an integral indicator in the calculation of economic potential makes it possible to present it as a key performance criterion. However, the analysis of factors affecting the economic potential of PJSC "Nizhnekamskshina" suggests that the development of events to increase individual sub-capabilities requires the selection of the most priority areas, that is, the selection of the key components through which this level is formed, and which indicators have the greatest impact on a particular sub-potential, becomes the key goal of the mechanism to increase the economic potential of the enterprise.

The set of proposed events to be included in the program to increase the economic potential of PJSC "Nizhnekamskshina" is presented in Table 1.

In order to increase the efficiency of events to increase the economic potential of PJSC "Nizhnekamskshina", it is necessary to establish the optimal ratio between maximizing the growth of economic potential and the amount of invested capital in the activities of the enterprise.

In order to calculate the economic potential of an enterprise, use the following formula:

$$EPP_{raz} = PP_{epp} + EPP_{t(i),}$$

where

EPP_{raz} optimal value of economic potential,
PP_{epp} autonomy factor;
$EPP_{t(i)}$ economic potential of the past period.

In order to diagnose the use of the economic potential of PJSC "Nizhnekamskshina", we recommend using the same indicator:

$$IEIP = 0.733 + 0.443\,X1 + 2.671X2 + 0.064X3 + 0.089X4 + 0.018X5,$$

where

X1 coating factor;
X2 autonomy factor;
X3 profitability of products;
X4 coefficient of fund recovery;
X5 ratio of average salary to minimum wage.

Table 1 Possible events to improve the economic potential of PJSC "Nizhnekamskshina"

Type of sub-potential	Activity
1	2
HR	– Upgrading the skills of workers and employees; – Development of a system of labour motivation, using innovative approaches; – Improving the working conditions of employees; – Reduction of staff turnover; – Corporate events, namely organizational events, seminars, trainings, etc.
Industrial	– Optimization of production costs due to increased labor productivity, savings of raw materials, electricity, etc.; Diversification of the production process; – Termination of unprofitable production and sale of unused equipment – Introduction of new equipment and technologies, etc.
Material	– Analysis of the structure of the property complex, development of recommendations for its modification; – Acquisition and implementation of innovative equipment and equipment; – Implementation of a system for monitoring and controlling the availability and movement of production stocks; – Reduced downtime of existing machines and equipment, etc.
Investment	– Development of a system for finding and attracting investors; – Diversification of the investment portfolio; – Granting preferences to buyers in shared construction; – Increasing financial independence from borrowed sources of financing, etc.
Financial	– Optimization of the ratio of own and borrowed sources of activity financing; – Sale of excess financial assets; – Debt restructuring; – Application of tax planning procedures; – Implementation of the budgeting system, etc.
Marketing	– Implementation of IT-technologies in the system of promotion and placement of goods – Improvement of PR technologies

Source Compiled by the authors

Using the proposed indicator, we will assess the efficiency of using the economic potential of PJSC "Nizhnekamskshina" for 2017–2019 (Table 2).

Calculation of the efficiency of using the economic potential of PJSC "Nizhnekamskshina" for 2017–2019 allows us to identify a downward trend. In 2018, the efficiency of using economic potential increased by 0.13 points. Moreover, the combined potential of the enterprise was influenced by all its constituent elements.

The unsustainable structure of funding sources reduces financial potential, and therefore increases the risks of financial sustainability in the long run. High dependence on borrowed capital becomes a factor of negative financial leverage. The

Table 2 Analysis of the efficiency of using the economic potential of PJSC "Nizhnekamskshina" for 2017–2019

Indicator	2017	2018	2019	Changes within a period	
				2018–2017	
1	2	3	4	5	1
X1	0.48	0.37	0.38	−0.10	X1
X2	0.06	0.10	0.12	0.04	X2
X3	8.75	8.58	8.62	−0.17	X3
X4	3.07	3.90	3.90	0.83	X4
X5	3.20	3.50	3.61	0.30	X5
EIEP	1.99	2.12	2.15	0.13	EIEP

Source Compiled by the authors

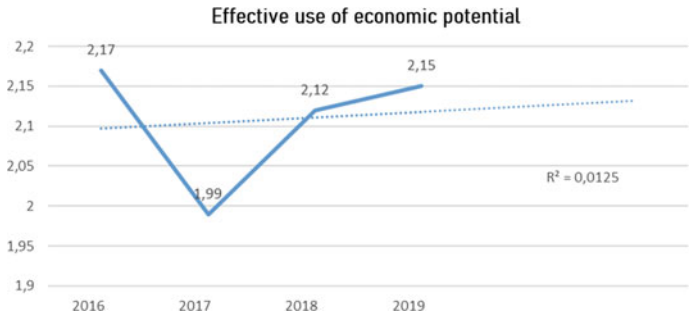

Fig. 2 Dynamics of the indicator of efficiency of using the economic potential of PJSC "Nizhnekamskshina" for 2017–2019. *Source* Compiled by the authors

amount of debt servicing costs becomes significant and reduces the amount of expanded reproduction.

The forecast of the effect changes from the use of economic potential revealed a negative trend (Fig. 2).

4 Conclusion

Using the tools of the Excel Analysis Package, we will assess the relationship between the amount of borrowed capital and the indicator of the efficiency of using the economic potential of PJSC "Nizhnekamskshina".

Let's build a table of primary data for arguments X—the amount of borrowed capital, Y—the efficiency factor of using economic potential (Table 3).

Table 3 Primary data of dependence of efficiency of using economic potential and value of borrowed capital of PJSC "Nizhnekamskshina" for 2017–2019

Period	Borrowed capital values (X)	Efficient use of economic potential (Y)
1	7,869,144	2.1
2	7,475,686.8	2.09
3	7,101,902.46	2.08
4	7,169,370.53	2.05
5	6,999,217	2.11
6	6,859,232.66	2.14
7	6,722.048.01	1.98
8	6,587,607.05	1.97
9	6,455,854.91	2.14
10	6,817,382.78	2.15
11	7,485,486.29	2.17
12	7,173,904	2.12

Source Compiled by the authors

The correlation calculation showed a high level of dependence between indicators, therefore, it is possible to conclude the priority of events aimed at optimizing the capital structure of PJSC "Nizhnekamskshina". Reducing dependence on external capital will increase the financial sub-potential and increase the total economic potential of the enterprise.

To stabilize the financial situation and optimize the financial strategy of PJSC "Nizhnekamskshina", it is proposed to form a system for optimizing the economic potential of PJSC "Nizhnekamskshina", it is recommended to establish an internal management standard—the "Scenario Planning System for Financial and Economic Activities of PJSC "Nizhnekamskshina" for a three-year period".

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Innovative Technologies of Chain Retail Leaders in Maintaining and Expanding Target Markets

Andrey N. Kostetsky, Natalia R. Chekashkina, Adelia R. Muratova, Margarita A. Shumilina, and Anna K. Bukhanova

Abstract The 2020 economic crisis has demonstrated the importance of technological innovations in the retail sector in order to preserve, and somewhere expand, the boundaries of target markets. Chain retail as an object of research is a striking example of using the opportunities of innovative technologies to successfully operate in a fierce competition against the backdrop of instability and recession of the economy. The decline in the economy in recent years has slowed the development and introduction of innovative technologies in the practice of chain retail, which significantly hit the retail business during times of severe restrictions caused by the pandemic. The retail sector showed insufficient consolidation, opening up potential opportunities for the growth of chain organizations, which encouraged them to integrate resources through mergers and acquisitions. However, the leaders of Russian chain retail, which progressively developed the sphere of technological innovation in pre-crisis times, actively joined in the refinement and introduction of their own developments to maintain market positions. By developing new sources of growth, companies face rivals who are not previously part of the traditional competitive landscape, but at the same time find themselves in industries that were not previously included in their direct interests. The work provides examples of innovative solutions used by the largest chain retail companies, analyzes the prospects for their further growth and makes recommendations for maintaining and expanding target markets.

Keywords Innovative solutions · Strategy · Target markets · Chain retail

JEL Codes M21 · M3

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1 Introduction

The global socio-economic upheaval caused by the pandemic and subsequent severe restrictive measures in the economy and public life of almost all countries of the world has led to dramatic multi-directional changes in the situation in consumer markets. In particular, retail enterprises found themselves in diametrically different situations—from the complete suspension of activities (clothing, shoes, furniture, home goods, sports goods, etc.) to the preservation and increase in sales (food, hygiene products), and sometimes explosive growth (pharmacy and medical products). Of course, such shocks are extremely difficult to predict at any level of development of strategic analysis and planning, but a study of some preliminary results of adaptation of the leading players in the Russian FMCG market shows that those companies that sought to advance the introduction of innovative tools and technologies are more ready even for such socio-economic shocks, which in the modern history of economic development did not have analogues.

In our opinion, new formats of offline and online trading, digital information processing technologies, presence on social networks, personalization of interaction with consumers, partner programs, etc. appeared not only and not so much under the influence of the events of 2020, objective prerequisites were updated from the moment when competition and differentiation of consumer markets became real factors of market activity of Russian companies.

The drivers of innovative solutions in retail are usually large companies, which on the one hand have more financial and intellectual resources, and on the other hand are more under competitive pressure and have to defend positions.

2 Methodology

The work used desk research methods to collect information, study various innovative approaches and technological innovations used in Russian retail, as well as analyze the prospects and trends of the development of the industry landscape under the influence of the progress of digital solutions and the associated growing opportunities for players to penetrate from other industries. During the observation process, the six largest players of chain retail in Russia were studied, their growth dynamics by the number of open points and revenue were compared, the activities of retail chains in the field of introducing innovative solutions for increasing efficiency were analyzed, etc.

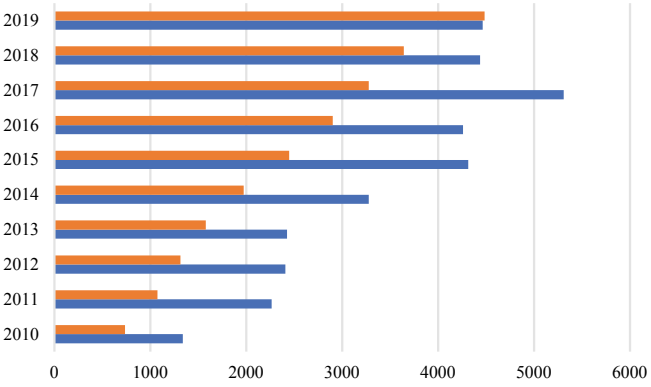
3 Results

According to the rating of the British consulting company Deloitte "Global Powers of Retailer 2019", compiled with the aim of reviewing global economic scenarios and their impact on the retail sector, the list of 250 largest retailers in the world included four Russian retailers: X5 Retail Group N.V (retail chains "Pyaterochka", "Perekrestok", PJSC Magnit (retail chains "Magnit Semeyny", "Magnit by your Home", "Magnit Cosmetics", "Magnit Health") in 51st place with revenue of $19.381 billion, "Lenta Group" ("Lenta" retail chain) in 157th place with revenue of $6.258 billion, "Dixi Group" Ltd. (retail chain "Dixi") on 201st place with revenue of $4.803 billion. The national rating of RBK 500, which represents the 500 largest companies in Russia in terms of revenue, also included X5 Retail Group N.V (7th place in the ranking), PJSC "Magnit" (9th place), "Lenta Group" (30th place), "Dixi Group" Ltd. (49th place), "O'Kay Group" (98th place). Comparing the results of activity for the year, it should be noted that only X5 Retail Group N.V and PJSC "Magnit" retained their positions since 2018, "Lenta" improved its performance and rose by one position, and "Dixi" and "O'Kay" significantly undermined their own positions (moved from 45 to 49 and from 66 to 98 places, respectively), which was the result of problems of an organizational and financial nature.

Turning to FORBES rating "200 largest private companies in Russia 2019", you can also observe the previously mentioned companies in the hundred largest by capitalization. So, X5 Retail Group N.V. with a capitalization of 1533 billion rubles. takes the third line of the list, followed immediately by PJSC Magnit, with a capitalization of 1237 billion rubles. in 19th place—Lenta (413.6 billion rubles), 29 and 30 places are occupied by the "Red and White" and Dixi Group of Companies with a capitalization of 301 billion rubles. and 298.7 billion rubles. respectively, and closes the six leaders of the grocery retail of Russia "O'Kay" (62nd place in the rating) with a capitalization of 161.3 billion rubles.

Let us consider the retail market in Russia, which is represented by the following major players: X5 Retail Group, Magnit, Lenta, Ashan, Dixi and O'Key, which is insufficiently consolidated and there are hidden reserves for its promising growth through the use of various strategies, including cooperation, in the form of vertical or diversified holdings (Mamchitz 2020). The largest chain retailers in Russia together occupy a relatively small market share—approximately 30% (Vedomosti 2020), which implies their further integration. This fact is confirmed by numerous examples: the purchase of the premises of the Seventh Continent retail chain X5 Retail Group, "Dixi" and "Azbuka Vkusa"; "Lenta" bought 22 stores of the Siberian retailer "Holiday"; the merger of the Dixi chain retailer with the "Bristol" and "Red and White" alcoholic beverages stores (Ishchenko and Vedomosti 2020). The process of consolidation of the industry continues, despite the slowdown in growth, as the current economic situation contributes to the release of profitable retail space previously occupied by regional players.

The analysis of development of large retail chain stores (X5 Retail Group, "Magnit", "Lenta", "O'Kay", of "Dixi") for the last ten years showed that the most saturated



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total revenue, billion rubles.	736.0	1075	1313.8	1578.9	1973	2447.3	2901.6	3277.9	3643.3	4484.1
Number of open points of sale, pcs.	1338	2264	2408	2426	3277	4314	4260	5309	4437	4465

Fig. 1 Change in revenue of the top five chain retailers depending on growth. *Source* Compiled and built by the authors

in terms of growth of chain retail in general 2015–2016 when there is a mass consolidation of the industry showed, however the period of 2018 and 2019 is observed reduction of number of again opened outlets that was only aggravated with the current situation connected with quarantine events. Therefore, in 2019, 10% fewer new stores were opened than a year earlier, experts estimate 2020 as a failed year in terms of chain growth and, as a result of this fact, predict a drop in retail turnover to 2% per annum, which happened in Russia for the first time since 2000 (Baharev 2020) (Fig. 1).

The events of this year showed the level of readiness for the challenges of modern reality in the field of technological innovation. The most popular and relatively traditional was the format of online sales, and the related food-tech direction for the delivery of retailer products. This has long been a progressive solution, but in the light of the recent events related to the coronavirus pandemic in the world, it has become relevant and has received explosive growth. Not all retailers have their own logistics network, but all leaders use the resources available to them: in X5 Retail Group—5Post for the delivery of orders from online stores and marketplaces to distribution points and automated lockers in "Pyaterochka" supermarkets, "Perekrestok" supermarkets and Carousel "hypermarkets"; "Magnet"—using its own mobile application "Broniboy" and integrated application system; "Lenta" uses a direct sales channel through its own mobile application "Lenta—Product Delivery", as well as participating in the "Sbermarket" collaboration project; "O'Kay"—a service for delivering products through the online store, using its own resources and the application; Dixie—mobile applications for discounts and promotions, as well as delivery of products.

In continuation of the delivery issue, chain retailers drew attention to the prospects for the development of the ready-made food delivery market—in Russia, the segment

of ready-made food users is 10%, while in the USA—50%, and in Europe—30%. The X5 Retail Group is testing the possibility of entering a completely new technological market, for the implementation of which the company launched the largest automated kitchen factory in Russia in the Moscow Region with a capacity of 120 tons of finished food per day of 600 items, and in the future it is planned to scale this project in the whole country. "Lenta" is testing a project to deliver finished food on the "Lenta" platform when the order is delivered from 15 min.

The innovation of recent years in Russian chain retail is considered the introduction of the dark-store format, which appeared in the UK in the early 2000s, and received rapid development only after 10 years. In Russia, among FMCG retailers in the top five, they were the first to turn to this format X5 Retail Group in 2018, opening the first dark-store for "Perekrestok". Currently, the company has four dark-store stores (3 in Moscow, 1 in St. Petersburg), with plans for 2020—the opening of one dark-store in Moscow and St. Petersburg (Shehterman 2020). "Lenta" is also experimenting with the dark-store format for online sales.

In addition, speaking about trends in food-retail, X5 Retail Group directs significant attention to optimizing the company's expenses through the search for employee time savings reserves: electronic price tags, electronic self-service cash desks, a system of video analysis of queues at cash desks (Shehterman 2020), a pilot project to introduce payment using a dynamic QR code. New technologies in the activities of "Magnit" are manifested in the form of video control of the queue at the cash desks, video monitoring of the shelf to optimize the planogram of goods, FacePay ("payment by face") to pay for family purchases (Ismailov 2020). Tape also equips stores with self-service cash registers, the latest self-scanners and LED TVs for internal advertising. In addition, each retailer is aware of the benefits of introducing innovative approaches in technological operations and chain retail leaders successfully test the use of big data, machine learning in order to determine, predict and evaluate the elasticity of demand at a price, apply modern approaches to managing traffic flows and movement of goods.

The use of neural networks is also an innovative technology for more accurate forecasting of demand for goods, and therefore timely adjustment of trade supply. According to "Magnit", using machine learning methods can improve analytics and increase forecast accuracy by 3–5%, reduce product shortages by 2%, reduce the amount of write-offs to 5%. In addition, neural networks allow "to reduce time costs for analysis, reduce losses in those outlets where supply exceeded demand, and vice versa, increase the supply of specific products in demand from buyers," which generally increases the economic efficiency of the retailer.

Chain retail widely uses modern technologies in loyalty programs, which introduce gamification processes with the integration of their own applications, to more effectively promote their own services to the consumer. Despite the active introduction of technologies into the operational activities of retail, the consumer is increasingly using the proposed tools in the practice of making purchases: video analytics systems to reduce queues at cash registers, neuro-marketing technologies, smart price tags and packaging, etc. The use of robots in retail is gaining popularity, and VR and AR reality technologies will become an integral attribute of shopping

for the modern consumer, as well as QR codes for paying for goods and services—a necessary service for contactless payments.

4 Conclusion

The results of the research showed that all chain retail leaders actively use innovative solutions in activities with different degrees of priority. External factors of modern reality have accelerated the progressive development of technologies that are aimed not only at increasing efficiency in servicing consumers, but also at improving the management system of the company as a whole. Thus, due to the widespread introduction of technological innovations, companies need to constantly monitor not only consumer demands and desires, but also focus on the manageability of the entire system. The modern clutter of platforms and services makes it difficult to coordinate the management of the company itself, which can lead to a decrease in retailer efficiency. In addition, maintaining the right level of technology resources, upgrading IT infrastructure and business processes requires a constant level of investment that only large successful chain retailers can allow. The competitive environment is also aggravated and players who previously did not pose a special danger to retail, for example, the transformed SBER or Yandex system with trading and delivery services, enter the field. All the above factors contribute to a dynamic change in the retail landscape itself and require special attention in trying to choose a strategy for the further development of the company in order to maintain and expand target markets.

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Targets for Inclusive Growth of Cooperative Forms of Small Business

Olga A. Rodionova, Tamara G. Evsyukova, and Oksana T. Kopytina

Abstract The article considers the cooperative form of entrepreneurial activity in accordance with the principles of sustainable development. The role of small forms of entrepreneurship in achieving inclusive growth is determined. An express analysis of the cooperative form of agricultural entrepreneurship of the USA and Russia was given. The cooperative was considered as a subject of small business in the implementation of the project approach. A margin analysis of the performance indicators of agricultural organizations participating in the national project "Labor Productivity and Employment Increase" was carried out. Two groups were formed, which included cooperative-type organizations—agricultural production cooperatives (SEC) and corporate-type companies with limited liability and closed joint-stock companies (LLC, ZAO). A CVP analysis (margin analysis) of the performance indicators of SEC and LLC as representatives of the cooperative and corporate form of entrepreneurship was carried out to determine the level of business activity and increase labor productivity. It has been determined that financial situation cooperatives are less sustainable than corporations. The purpose of cooperatives is different. They are focused on labor motivation and economic incentives workers, despite lower financial availability.

Keywords Agricultural organizations · Cooperatives · Small business · Inclusive growth · Target taglines · Margin analysis

JEL Codes Q22 · R23

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1 Introduction

In order to achieve inclusive growth of the economy of the agri-food sector, the functional and sectoral structure of entrepreneurial activities of micro-level economic entities must change. These include cooperatives. Food and Agricultural Organizations continues to draw attention to the expansion of cooperative activities. The documents of this organization emphasize that cooperatives must make a significant contribution to combating poverty and achieving food security.

Today, as the economic crisis due to the coronavirus pandemic deepens, these circumstances are becoming increasingly important throughout the world. Cooperatives are included as implementing partners in achieving the Sustainable Development Goals (SDG) and are designed to develop the capacity of small producers (farms, small enterprises) to attract investment in agriculture.

The UN resolution on the Decade of Family Farming (2019–2028) focuses on the sustainable development of agricultural cooperatives based on the network of their participants. In 2018, FAO and the International Cooperative Alliance (ICA), within the framework of the Memorandum on Cooperation, broadened the obligation to create cooperative models in the agricultural sector, which meets the principles of sustainable development and ensures inclusive growth of all participants. To achieve these goals, it is intended to replicate the experience of effective and responsive cooperatives to the needs of their members, including small producers. Particular importance is attached to promoting the participation of cooperatives and their members in national and regional projects to create an enabling environment and support employment.

Cooperatives are a proven model that can support the sustainable development of small-scale producers and family farms to achieve economies of scale, improve their access to markets, credit, information and other resources and improve the profitability of their members. This is proved by the practice of cooperatives in Germany and other European countries, especially the USA during the Great Depression in the 30s of the twentieth century. The successful development of agriculture was achieved with the development of a cooperative system, from production to trade. This phenomenon has become known as the cooperative effect. In the United States, cooperatives differ from other types of corporations. They are classified as non-profit corporations or "with deviations." They are given a special status of taxpayers with a tax code—a corporation with the letter "C" or "S" (Barton 2003). The comparative characteristics of cooperatives in the USA and Russia are given below (Fig. 1).

As for the Russian system of cooperatives, there are downward trends in their development. This is especially true for agricultural production cooperatives. Despite the fact that the legislative framework of agricultural cooperation is constantly improving, however, the number of cooperatives as a form of small business is constantly declining, which indicates an alarming signal about the modern level of their development.

FAO focuses on the creation of cooperatives that provide equal opportunities not only for farmers but also for marginalized groups, including youth and women.

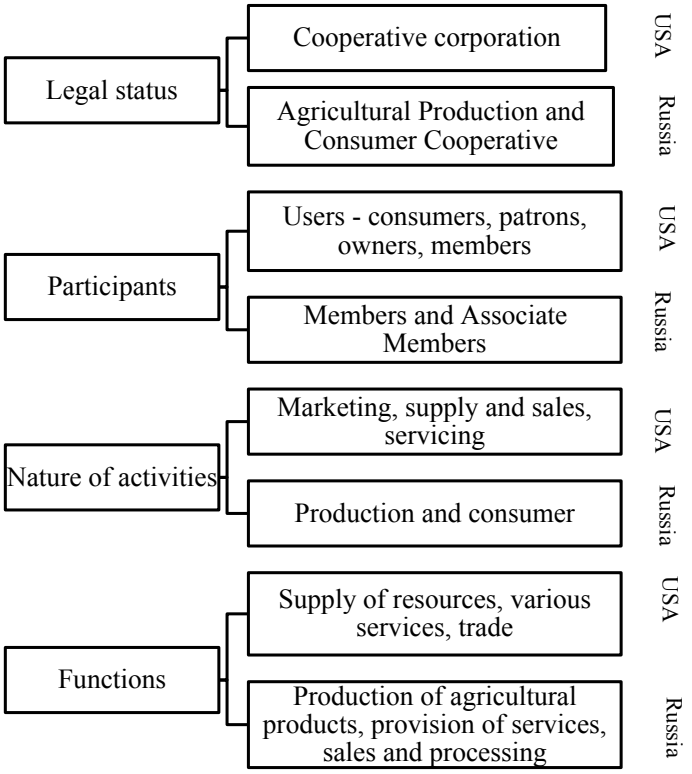

Fig. 1 Cooperatives of the USA and Russia: comparative characteristics. *Source* Rodionova (2017)

These problems are discussed on international platforms with the involvement of representatives of science, business and government. Here are the international scientific and practical conferences that took place in the online format in 2020, where the authors of this article were participants in the performances (Rodionova and Evsyukova 2020a, b). Panel sessions focused on critical issues such as sustainable development and inclusive growth, entrepreneurship and agricultural cooperation in a digital transformation (IAMO, Germany; TSUE, Uzbekistan). For example, reports by Adewopo J. highlighted the importance of inclusive digital development in agriculture (Adewopo 2020), Donokhon S. discussed the sustainable development of vertical farming (Donokhon 2020).

Within the framework of the International Scientific and Practical Conference on the Development of the Agrarian Economy (October 14–15, 2020, Russian State Agricultural University named after K.A. Timiryazev), the problem of transforming the Chayanovsk doctrine on cooperation as a platform for small forms of farming in the modern development of agriculture was discussed (Chayanov readings 2020).

The study of cooperative issues emphasizes that cooperatives achieve sustainable development if the economic interests of different groups of participants are harmoniously respected, namely:

- agricultural producers and rural population;
- unions and associations, among which cooperative organizations have a special place;
- regional and local governments;
- political parties.

Note that the modern model of the cooperative form of entrepreneurship in Russia is based on several laws. For confirmation, please refer to the legislative provisions, types and scope of cooperatives (Table 1).

As it can be seen from Table 1, both agricultural cooperatives of both types and consumer societies are responsible for the production, processing and marketing of agricultural products, as well as the provision of a range of services. However, their creation and functioning are regulated by different laws. To harmonize the economic interests of participants in cooperative activities, the scientific community attempted to justify a single, so-called "framework" law on cooperation. Along with the general conditions, forms and mechanisms for the activities of cooperatives of small forms

Table 1 Legislative provision and scope of cooperatives in the agrarian sphere

Scope of cooperatives	Type of cooperative The law governing the establishment and operation
Production, processing and sales- agricultural products, including fish products	Agricultural Production Cooperative Federal Law "On Agricultural Cooperation" dated 8.12. 1995 N193-FZ with rev. from 01.06.2018
Production, processing and sales- Meat, dairy, vegetable, fruit and berry products; bakery and other products **Provision of services, works and maintenance-** Purchase and sale of means of production (fertilizers, protective equipment, petroleum products, feed, etc.); scientific, production, legal and financial advice; mechanized, agrochemical, reclamation, transport and construction works	Agricultural consumer cooperative (processing; sales and distribution; supply) Federal Law "On Agricultural Cooperation" dated 8.12. 1995 N193-FZ with rev. of 01.06.2018
Production and Sales trade- Foodstuffs and non-foodstuffs; purchase of agricultural products, wild fruits, berries and mushrooms, medicinal and technical raw materials, their processing and sale **Services-production and household services**	Consumer cooperative (consumer society, union) Federal Law "On Consumer Cooperation (Consumer Societies) in the Russian Federation" dated 19.06.1992 N3085-I with rev. et al.

Source Compiled and based on the basis of legislative acts

of entrepreneurship were proposed. During the discussion, the bill was rejected and did not enter the stage of practical implementation.

Let's talk about some of the discussion issues that are significant, since they relate to budget support for small businesses. The fact is that there are differences in the concepts of "small forms of business" and "small business entities." The term "small forms of farming" has been developed in relation to agriculture and rural areas. This group includes personal subsidiary farms, peasant (farm) farms and agricultural consumer cooperatives (Rodionova 2017). They are subject to budget support measures provided for in various support programs for small businesses. However, agricultural organizations, including production cooperatives, do not belong to small forms of economy, but by size can be small business entities. According to the current procedure, they cannot take advantage of support measures on an equal basis with peasant farms and agricultural consumer cooperatives.

In order to overcome these barriers, certain measures have been taken to boost small business in the Russian economy, as confirmed by the implementation of two national projects. One of them provides for events aimed at increasing labor productivity and supporting employment, the other—at developing small business and supporting entrepreneurial initiative, which provides for the development of rural cooperation.

The implementation of large-scale tasks is impossible without the development of rural cooperatives and cooperatives, different in scale of activity, which is provided for in one of the federal projects. Without, inclusive growth in the economy cannot be achieved.

2 Methodology

The calculation algorithm uses a CVP analysis technique, the main purpose of which is to determine the level of financial activity of a participating organization, in which the revenue from sales is equal to the sum of all variable and constant costs, and the profit is equal to zero. Variables include costs that change directly proportional to the change in sales volume and depend on the level of business activity. Fixed costs do not change if production (sales) quantities change and are relevant for the time.

One of the conditions for participation in the implementation of the national project "Labor productivity and employment support" is the implementation of targets. These include an increase in labor productivity—at least 5% per year and a decrease in material costs in the cost of production in the range: from 65% in 2018 and up to 45% in 2023. The calculations use the value of this indicator at the level of 60% in accordance with the analyzed 2019.

In order to confirm the above, a margin analysis of the performance of 26 agricultural organizations has been carried out. Further, agricultural cooperatives and organizations similar in characteristics (revenue, specialization, territory) with a corporate form were selected. At the next stage, organizations with similar characteristics are selected: specialization and coverage area. Using CVP analysis, calculate variable

and fixed costs to determine margin and threshold revenues to identify profitability and loss-making areas.

3 Results

In order to calculate indicators according to the CVP-analysis method, data from 26 agricultural organizations belonging to small business entities according to the revenue criterion and operating in 16 constituent entities of the Russian Federation were used. All CSAs are participants of the NP "Labor Productivity and Employment Support" (2020). This characterizes them as active participants in entrepreneurial activities aimed at sustainable development and inclusive growth. The characteristics of the Peasant Forms are shown in Table 2.

At the next stage, agricultural organizations representing various forms of entrepreneurship are taken as the objects of analysis: cooperative (SEC) and corporate (LLC, ZAO). For comparative analysis, two small agricultural enterprises were taken, in which the main activity is the cultivation of grain crops. They are located in the same localization zone. By organizational and legal form: agricultural production cooperative and limited liability company. Analyzed enterprises as participants in the national project do not use state support measures.

Table 2 Characteristics of small Peasant Farms by functional and industry characteristics

Criterions of classification	Total	Corporate (LLC, ZAO)	Cooperative (SEC)
1. Organizational and Legal form	26	24	3
2. Primary activity			
2.1 Crop production	13	10	3
2.2 Livestock production	13	13	–
3. Conditions of participation in the non-profit organization "Labor Productivity and Employment Support"			
3.1 Participation without support measures	16	13	3
3.2 Federal Competence Center support measures	7	7	–
3.3 Support measures for regional competence centres	3	3	–
4. Taxation system			
4.1 General system with VAT payment	15	15	–
4.2 Special tax regime (Single Agricultural Tax excluding VAT)	11	8	3

Source Compiled by authors based on source data (National project "Productivity and employment support." 2020)

Calculations were carried out according to the CVP analysis methodology with the separation of variables and constant costs and the determination of the following indicators: margin income, profitability, margin of financial strength and force of action of the operating lever (Fig. 2).

It is determined that in terms of financial indicators, cooperatives are inferior to corporations. So, the margin of financial safety, as well as profitability, is significantly higher in LLC than in SEC. The level of coverage of fixed expenses is also 1.5–2 times higher for LLC than in SEC. According to the level of margin income, no significant

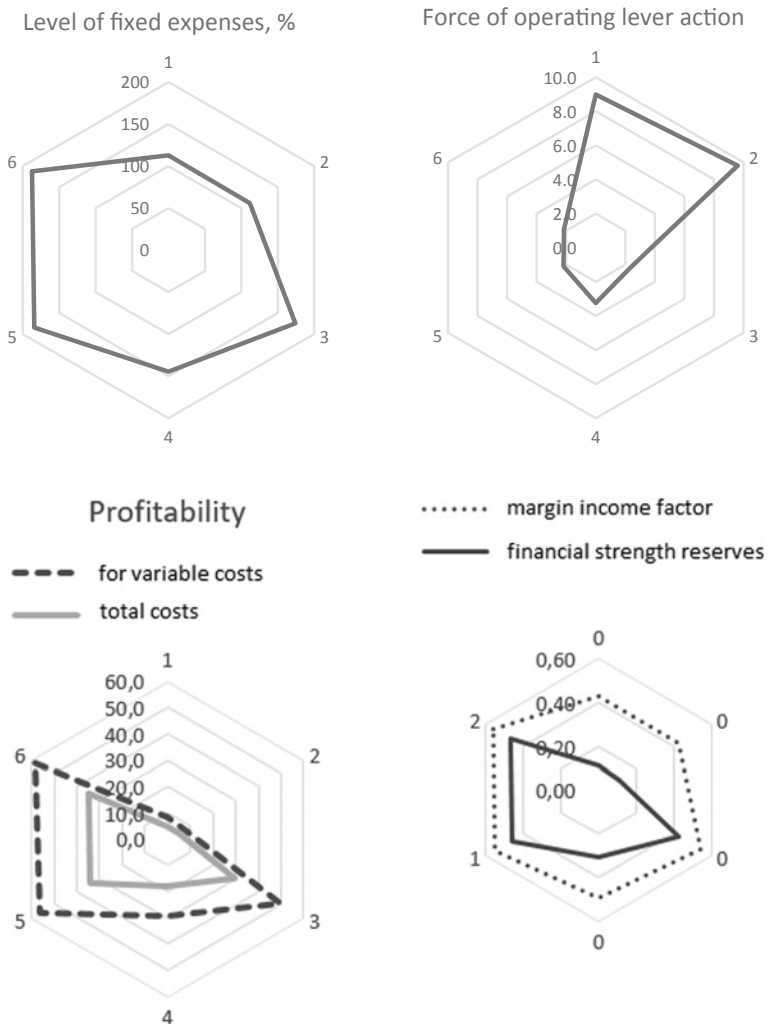

Fig. 2 Indicators of CVP analysis of investigated agricultural associations, 2019. *Source* Complied by the authors

difference is observed (0.43–0.61). Cooperatives are characterized by a higher value of the force index of the operating lever. This indicator serves as an indicator for determining the sensitivity of profits to changes in sales and is an effective tool for managing entrepreneurial activity.

4 Conclusion

The results of the CVP analysis showed that cooperatives are inferior in terms of development rates and financial condition to agricultural organizations of the corporate type of entrepreneurship. This is due to the fact that the activities of agricultural enterprises (LLC, ZAO), as a rule, are carried out in the system of interaction with agricultural holdings, which allows them to ensure more sustainable development. The goal of agricultural production cooperatives is different. They are focused on labor motivation and economic incentives workers, despite lower financial availability. Cooperatives have a stronger social responsibility to preserve rural livelihoods and sustainable rural development.

It should be borne in mind that agricultural producers have gone through several stages of reform. This makes them wary of developing a cooperative form of entrepreneurship. Its implementation requires not only state financial, but also social and political support. Production cooperatives have not become the predominant type of agricultural entrepreneurship. At the same time, without the development of cooperative forms of farming, it is more difficult to achieve positive results in solving the tasks set for Russian agriculture.

In this regard, we note that the vector of the development of the cooperative form of agricultural entrepreneurship can be in two directions: the first—along the path of localization, i.e., highly specialized activities; the second on the basis of diversification. The main thing is that representatives of different groups of the rural population, both from the industrial and social spheres of activity, can become members of the cooperative. The goal is to create equal opportunities for all participants to achieve inclusive growth. The coordination and protection of cooperatives is the responsibility of the associations and unions they have established. The structure of diversified activities of cooperatives includes the supply of resources, marketing and primary processing of agricultural products, the implementation of production, marketing and consulting services.

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Innovative Approach to Accounting Policy Development in Accordance with International Financial Reporting Standards

Tatyana V. Bulycheva, Antonina Y. Busheva, Olga V. Eliseeva, and Tatiana V. Zavyalova

Abstract Accounting policy is a tool that accumulates information about the methods, techniques and methods of accounting and financial reporting. The company's consolidated financial statements must be prepared in accordance with IFRS. This requires the development of accounting policies for international financial reporting standards within the scope of IAS 8. The hierarchy of international standards is the cornerstone of accounting policy building within the framework of international financial reporting standards. The understanding of the principle and methods of forming assets and liabilities, undoubtedly, imposes its imprint on the process of developing accounting policies in the company. The aim of the study is to develop an innovative approach and methodological tool for accounting policies in accordance with international financial reporting standards. During the study, methods were used: synthesis, abstraction, classification, analysis, synthesis, modeling. As part of the study, methodological tools for the formation of accounting policies within the framework of IFRS and taking into account modern business realities were proposed. The proposed methodological tools for the development of accounting policy within the framework of IFRS will deepen the current accounting practice of applying world standards in Russian companies.

Keywords Accounting policy · IFRS · Assets · Liabilities · Impairment · Method · Hierarchy · Methodology · Materiality · Innovation

JEL Codes M480

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1 Introduction

In order to ensure high results in the organization of the accounting process in modern conditions, it is necessary to apply new approaches, innovations. "To reduce the level of risk and increase the validity of decisions, it is necessary to organize the provision of this process with sufficient, reliable and timely marketing information…" (Khairov and Kuznetsova 2013).

The accounting policy is aimed at managing objects and processes. This is the choice of adequate models to implement the objectives of the accounting process. The creation and development of new non-traditional approaches to the organization of the accounting process is one of the main tasks of enterprise management.

The purpose of this article is to identify an innovative approach to the formation of accounting policy in modern realities.

In order to achieve this goal, the following objectives are set:

- analyze the concept of materiality under IFRS,
- Propose approaches to the formulation of accounting policies in accordance with international standards.

Foreign and domestic economists contributed to the study of the essence of accounting policy: M.Yu. Medvedev, Y.V. Sokolov, M.I. Tugan-Baranovsky, J. Betge, F. Knight, P. Samuelsen, F. Schmidt, and Fisher and others.

At the same time, the issues of forming accounting policies and using new approaches are relevant to date.

2 Methodology

Analysis of the definition of materiality by international standards.

The definition of materiality has become more understandable. Previously, there were different formulations of the same concept, which led users to bewilderment. Since this concept is quite common in standards, the clarification of the definition concerned:

- IAS 1 Financial Reporting; Conceptual framework for financial reporting; Regulation on Practical Application No. 2 "Making Judgments on Materiality"; IAS 8 Accounting Policy, Changes in Accounting Estimates and Errors;
- IAS 10 "Events after the reporting period," IAS 34 "Interim financial statements," IAS 37 "Valuation liabilities, contingent liabilities and contingent assets" and individual paragraphs of the IFRS 2, IFRS 2 (IFRS) guidelines are brought into line with the new definition.

In all cases, the phrase "economic solutions" was replaced by the word "solutions," and the concept of "users" was narrowed down to "main users." Let us dwell on the main features of the new definition.

In the old definition of materiality, attention is paid to the distortion of information in reporting and the non-submission or omission of information and nothing about blurring. But blurring essential information can affect users' decisions, such as distortion or skipping. The user may simply not notice the essential information hidden in the plurality of non-essential details.

In addition to the fact that the word "obscuring" itself is included in the definition of essential information, the following explanatory provisions are added.

Information is blurry if it is transmitted in a way that has an effect similar to the effect of omission or distortion of such information on primary users of financial reporting.

We explain when information is recognized as substantially clouded:

- information about a material article, transaction or material event is disclosed in the financial statements is unclear and vague;
- different parts of information about a material item, transaction or material event are disclosed in different places of financial reporting, "scattered" throughout the financial statements;
- Information on articles, transactions or events of a different nature and nature is not properly combined;
- Information on articles, transactions or events of a similar nature and nature is disclosed separately and is not properly divided;
- The understanding of financial statements is deteriorated by concealing material information for the non-essential such that the primary user of the financial statements is unable to determine which information is material.

Thus, enterprises have been helped to avoid situations in which the blurring of substantial information, the concealment of substantial information behind a large amount of insignificant information, entails an effect similar to distorting or refusing to provide substantial information.

These changes were needed to make the definition of materiality more specific. If, when determining the materiality of information, it is difficult to consider the needs of all reporting users, not just the main ones, it is difficult to determine for whom the information will be significant and for whom not. For example, information about tax liabilities may be important to the tax authority, but it is not so necessary for shareholders (owners) of the enterprise to make decisions.

When determining whether information can affect the decisions of the main users of general-purpose financial statements, it is necessary to take into account the characteristics of these users and consider the circumstances in which the enterprise operates. By defining the circle of main users, one cannot limit oneself to existing investors and creditors. It is necessary to take into account potential ones.

Consideration should be given to the types of decisions made by key users of information based on financial statements compiled according to international standards in order to understand what information they need. These are decisions to provide the enterprise with resources, for example, the purchase, sale or retention of equity and debt financial instruments, the provision or repayment of loans, the enforcement of rights, for example, voting rights. Such decisions depend on the amount of income

that major users expect to receive from investing in financial instruments. And the amount of expected income depends on how they estimate the amounts and timing of cash receipt and disposal, as well as the uncertainty of future net cash income. To do this, it is important to assess how well the management of the enterprise manages money. Therefore, the main users of IFRS financial statements need information:

- first, it's about the assets of the enterprise, its requirements, equity and changes in such assets and requirements, that is, income and expenses;
- second, it's about the level of efficiency of enterprise resource management.

> Various authors note that the transition to IFRS in developing countries brings various benefits to the economy. The key among these points is accelerated economic development. (Epstein 2009)

By defining the concept of materiality, it is necessary to determine how information will affect the economic decisions of users. After all, the purpose of financial reporting is to provide the main users with financial information that is useful to them for making decisions on the provision of enterprise resources.

However, general-purpose financial statements cannot meet all the information needs of its main users. Therefore, it is necessary to strive to meet the general, common needs of the main users, and not the special needs of individuals. You need to imagine what decisions the main users of the statements can make and how information in the financial statements can affect them.

3 Results

Accounting policy is a tool that accumulates practical approaches that the company uses in the formation of financial statements.

IAS 8 Accounting Policy, Changes in Accounting Estimates and Errors establishes criteria for selecting and changing accounting policies, as well as accounting and disclosure procedures.

The current accounting policy scheme under IFRS 8 "Accounting policy, changes in accounting estimates and errors" is shown in Fig. 1.

In order to meet the requirements of a special accounting policy standard, three steps must be taken:

1. Find a standard that can be applied directly to an operation, event, or condition.
2. Identify standards that govern similar and related issues.
3. Check whether you can apply the Financial Reporting Conceptual Framework.

The list of steps for approaches to accounting policies depends on whether there are IFRS addressing similar or related issues.

When an international standard specifically applies to an operation, event or condition, the accounting policy for such operations, events or conditions is determined by applying that standard. Let's look at a list of steps to develop an accounting policy.

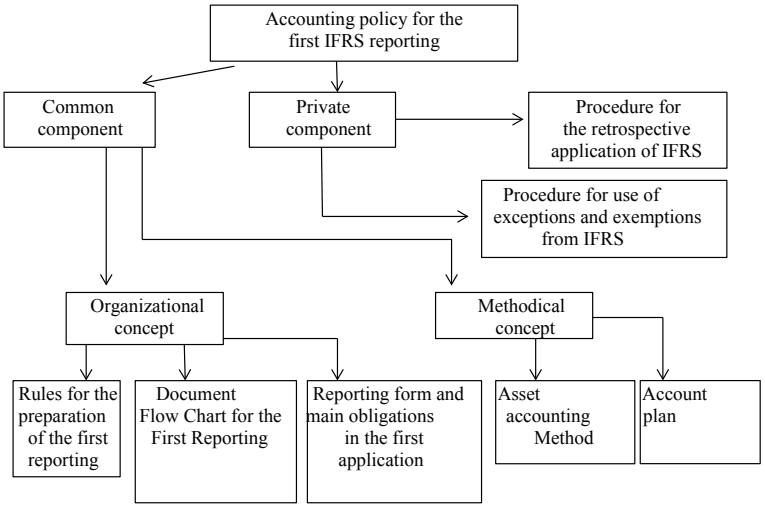

Fig. 1 Current IAS 8 Accounting Policy Development Scheme. *Source* IFRS 8 "Accounting policy, changes in accounting estimates and errors"

Step one. If IFRS is specifically applied to a transaction, event or condition, use IAS 8 Accounting Policy, Accounting Valuation Changes and Errors. And even in cases where the requirements of this standard do not comply with the provisions of the Conceptual Framework.

For example, under the law of the country, enterprises are required to pay a mandatory fee as soon as they recognize revenue in 2021. The collection amount is calculated based on revenue recognized in 2020. Accounting for such a fee falls within the scope of the IFRIC 21 explanation "Mandatory Payments". The end date of the reporting period of the enterprise is December 31, 2020. The company recognizes revenue in 2020 and in 2021 begins to recognize revenue on January 3.

IFRIC 21 establishes that a binding event leading to recognition of an obligation is an activity that results in a mandatory payment obligation under the law. In this case, the recognition of revenue in 2021 will be a binding event. At the same time, revenue recognition in 2020 is necessary to determine the amount of liability, but not enough for an obligation to arise, even if the enterprise is economically forced to recognize revenue in 2021.

Applying the explanation of IFRIC 21, the company does not recognize the obligation in the reporting period, which ends on December 31, 2020. And for the first time, it recognizes the obligation to pay the fee on January 3, 2021.

If the enterprise were guided only by the Conceptual Framework, it could recognize the obligation earlier. Indeed, according to this document, an obligation is considered to have arisen when the enterprise:

- has already received economic benefits or taken measures and must make a mandatory payment, which otherwise it would not have to make;

- it is not practicable to avoid mandatory payment.

The first condition is satisfied during 2020 as revenue is recognized. At the same time, if the enterprise does not have a practical opportunity to avoid recognition of revenue during 2021, then the second condition is met. Therefore, according to the Conceptual Framework, the obligation arises as revenue is recognized in 2020.

But since such fees are included in the scope of the IFRIC 21 explanation, which determines the moment of recognition of mandatory payments, it is IFRIC 21 that needs to be applied to determine the moment of recognition, and not the Conceptual Framework.

Step two. Accounting policies must undoubtedly provide meaningful and reliable information.

The descending mechanism assumes a hierarchy and means that the Conceptual Framework should be addressed only if there are no such IFRS.

The compilers of the reports make professional judgements as to whether other international standards regulate similar and related issues. Moreover, professional judgment should be made, taking into account all aspects of this IFRS. Such aspects may include disclosure requirements. Otherwise, it is incorrect to apply only certain requirements of the selected IFRS, if its other provisions also regulate the transaction in respect of which the enterprise develops an accounting policy (although in practice there may be no need to apply all the requirements of this standard).

For example, the bank borrows gold from one party (contract 1) and provides this gold to the other party for the same period, but for a larger fee (contract 2). The bank enters into two contracts, expecting that they will both be executed, but the contracts are not legally connected with each other. These are back-to-back commodity loans.

Under each contract, the borrower receives the right to own gold at the time of conclusion of the contract and, after the expiration of the period specified in the contract, undertakes to return gold of the same quality and in the same amount as it received. Each borrower pays a fee to the lender during the term of the contract, but no payments are made at the beginning of the term of the contract.

In preparing financial statements under IFRS, banks may conclude that there is no standard governing the accounting rules for such contracts, as they:

- are not recognized as leases falling within the scope of IFRS 16 “Leases”. These agreements do not provide for dependence on the use of the identified asset: each borrower has the right to return not the same gold that he borrowed;
- are not covered by IFRS 9 “Financial Instruments.” After all, gold is a commodity, not a financial asset IFRS 9 “Definition of a financial instrument: a ingot of gold”. Although IFRS 9 applies to individual contracts for the purchase and sale of non-financial objects, the contracts are recognized as loan rather than sale agreements by way of example (IFRS 9, para. 2.4);
- do not fall within the scope of IAS 2 “Reserves,” since gold borrowed is not an asset held for sale or in production for sale or in the form of raw materials or materials to be consumed in the production or provision of services (IAS 2);
- do not fall within the scope of IAS 37 Valuation Liabilities, Contingent Liabilities and Contingent Assets: a bank’s obligation to return gold is not an obligation with

an indefinite period and an undefined amount, since the contract between the bank and the lender leaves no uncertainty as to the period of return or the amount of gold to be returned (IAS 37).

Notwithstanding the above, several IFRS may be considered to address similar and related issues, such as:

- IFRS 9 establishes requirements for borrowed or loaned financial assets under an agreement involving the return of the same or substantially the same asset. These requirements apply to both those who transfer a financial asset and those who receive it;
- IFRS 16 establishes requirements for enterprises that lease an asset from one organization and sublease it to another. These are the so-called intermediate landlords;

> The IFRS Interpretation Committee is aware of the lease under IFRS 16 and a reverse lease sale transaction with variable payments that do not depend on index or rate, and concluded (and IFRS Board agreed) that it would be useful to amend IFRS 16 to indicate how the tenant seller should apply the subsequent evaluation requirements set out in IFRS 16, in respect of a lease obligation arising from a reverse lease sale transaction. (IASB Issues Guidance on Management Commentary Web-resource 2020)

- IAS 2 "Inventory" sets out requirements for reserves purchased by the organization, and IFRS 15 "Revenue under contracts with buyers" sets out requirements for contracts for the sale and repurchase of the same or practically the same asset. The definitions of the terms "asset" and "obligation" in the Conceptual Framework are based on the identification of the rights and obligations of the enterprise. Based on these definitions, the bank could recognize:
- the obligation under contract 1 to return to its lender a certain amount of gold of a certain quality, which it borrowed;
- an asset in relation to the right under contract 2 to receive back gold of a certain amount and quality, which he had previously borrowed.

As a result, the drafters of the bank's financial statements may conclude that none of the existing IFRS contains rules for accounting for such contracts, therefore, does not apply specifically to them, but individual IFRS regulate similar and related issues.

If the drafters come to this conclusion, they should develop an accounting policy for treaties, analyzing the requirements of one or more standards governing similar and related issues. In doing so, they must use their judgment to meet all the requirements of such standards, including disclosure requirements.

Accounting policies designed to meet these requirements may not match accounting policies that would be developed using the Conceptual Framework.

Step three. The definitions, criteria for recognition and evaluation of the Conceptual Framework should be used if no international standard:

- does not apply specifically to an operation, event or condition;
- does not regulate similar and related matters.

For individual transactions, events, or conditions, there may be several issues for which you need to develop an accounting policy. At the same time, for one issue there may be IFRS governing similar and related issues, and for others not. Then for the first question you need to use the selected IFRS, and for other questions you need to turn to the Conceptual Framework.

For example, the Enterprise and the tax authority argue whether the enterprise is obliged to pay tax. The disputed tax does not fall within the scope of IAS 12 Income Taxes. Any obligation or contingent obligation to pay such tax falls within the scope of IAS 37.

Knowing everything, the compilers of the financial statements of the enterprise come to the conclusion that with a high probability the enterprise will not be obliged to pay tax. The probability that the dispute will be resolved in favor of the enterprise exceeds 50%. Applying IAS 37, the company discloses the contingent liability and does not recognize it.

> Such blending of different measurement methods is considered to create mismatch problems when different items in the same set of accounts are measured on a different basis, so aggregation is misleading (Whittington 2010).

In order to avoid possible penalties, the company deposited the disputed amount with the tax authority. After resolving the dispute, the tax authority will either have to return the deposit to the enterprise (if the dispute is resolved in favor of the enterprise) or use it to pay off the obligation (if the dispute is resolved in favor of the tax authority).

When deciding on the tax deposit, it is necessary to solve:

- whether the placement of a deposit leads to the emergence of an asset, a conditional asset or does not entail the appearance of any asset at all, including a conditional one;
- if the deposit leads to the emergence of an asset, whether it must be recognized, and if so, how to evaluate and report it and what information about it to disclose.

It can be concluded that the enterprise has a right that will ensure economic benefits regardless of the outcome of the dispute with the tax authority. If the outcome is favorable, the enterprise will receive economic benefits in the form of a tax deposit return. And in the event of an adverse outcome, it uses a tax deposit to pay off its tax obligation. And despite the uncertainty about the form of economic benefits, there is no uncertainty about the right of an enterprise to benefit in one form or another.

Therefore, it can be concluded that the tax deposit assumes the presence of an asset. A tax deposit is an asset, not a contingent asset, since there is no uncertainty about its existence.

In accordance with the requirements of IFRS, the compilers develop an accounting policy for the recognition, assessment, presentation and disclosure of tax deposits. At the same time, they make their judgments in the process of applying all aspects of IFRS applicable to these issues. If none of the existing IFRS addresses such or related issues, the drafters refer to the Conceptual Framework.

> The IFRS Board stated that such a flexible approach would lead to more complete disclosure of the most important resources, risks and relationships that could affect the company's value and how to manage them. (IAS Plus—IFRS 2020)

4 Conclusion

The main results of the review of the theoretical and methodological foundations of innovative approaches to the formation of the accounting policy of the enterprise under IFRS are systematized into the following conclusions.

First, the company's management may take into account materials of other standards, which in the end do not contradict the norms of the Conceptual Framework or the requirements of IFRS.

Second, if no standard specifically applies to an operation, there may be no disclosure requirements for such operation. At the same time, the general requirements for the presentation and disclosure of such information:

- to present in the statement of financial position and in the statement of profit or loss and other comprehensive income additional items other than those listed in IAS 1;
- to disclose the nature and amounts of material items of income and expenditure, information needed to understand financial reporting, significant accounting policies, information on assumptions made about the future and other main sources of uncertainty related to estimates.

Third, if financial reporting entities develop accounting policies for similar and related IFRS requirements, they consider all requirements relating to such matters, including disclosure requirements.

> A study of the company's accounting policy can show whether the company's management reports profits conservatively or aggressively. This should be taken into account by investors when viewing profit and loss statements to assess the quality of income. (Corporate finance & accounting 2020)

We propose an innovative approach to the formation of accounting policy in accordance with international standards, which looks like the next block of the diagram (Fig. 2).

The proposed method of forming accounting policy includes several stages consisting of separate procedures:

Stage 1 A preparatory, accumulating study of common requirements and approaches to the formation of accounting policies. In addition, a comparative analysis of the individual provisions of the accounting policy under RAS and IFRS in terms of estimated values is carried out. As a result, an IFRS accounting policy is formed.

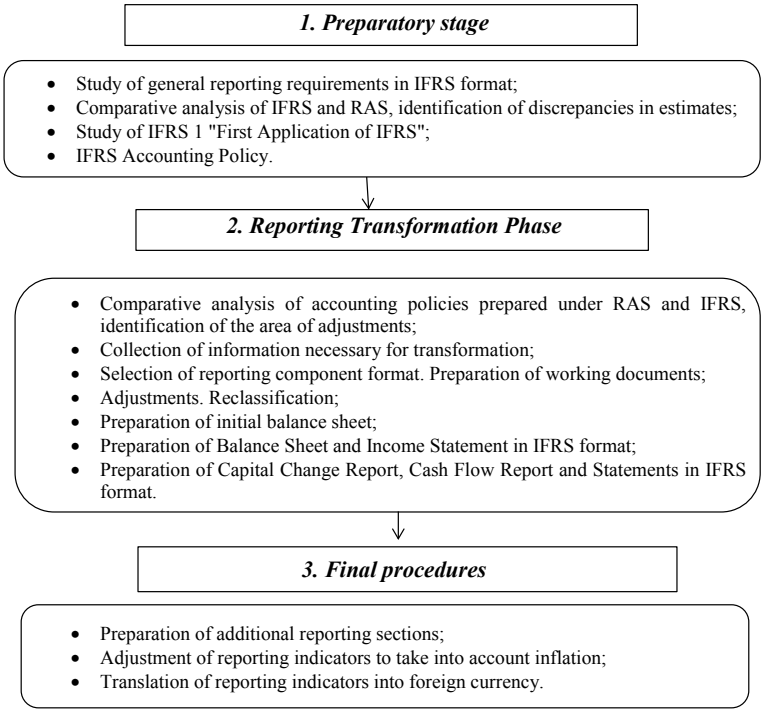

Fig. 2 Innovative approach to accounting policy preparation under IFRS 8. *Source* "Accounting policy, changes in accounting estimates and errors" (author's methodology)

Stage 2 Transformation of financial statements into IFRS format. At this stage, it is proposed to compare the accounting policy on RAS and IFRS. The transformation algorithm, the list of transformational procedures and reclassification records are selected. A complete set of IFRS reporting is being prepared.

Stage 3 At the third stage, reporting indicators are translated into foreign currency. This should be guided by IFRS 21, Impact of Exchange Rate Changes.

The proposed accounting policy is a modern tool for preparing financial statements in accordance with IFRS.

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Problems of Development of Insurance Cooperation in Russia

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Abstract Cooperation is of great importance for the socio-economic development of the country. It solves such pressing issues as fighting poverty and unemployment, increasing productivity, etc. Cooperative insurance protects the property interests of its members and allows reducing the burden of the budget in terms of reimbursement of damages in the event of insured events. Insurance cooperatives and their associations occupy a significant share of the financial structure of particular Western countries. In pre-revolutionary Russia, insurance services in the form of mutual insurance companies accounted for up to a quarter of the total turnover of the Russian insurance market. Nowadays, this type of financial cooperation is experiencing significant difficulties, which do not allow cooperative (mutual) insurance to develop at an active and progressive level. The main problems faced by cooperative (mutual) insurance include incompleteness of legislative framework, insufficient state support, stiff competition of other new areas of commercial insurance, etc. In order to ensure effective development of cooperative organizations operating in various fields, including insurance, it is necessary to improve the regulatory framework, as well as organizational, methodological, and financial support from the state, taking into account Russian and international experience in organizing cooperative insurance.

Keywords Cooperation · Mutual insurance · Insurance cooperative · International experience · Domestic practice

JEL Codes G22

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1 Introduction

Cooperation significantly contributes to the global economy. The experience of many countries confirms the great potential of cooperative associations based on the fundamental principles of self-government, self-organization, solidarity, economic democracy, and initiative. There are many examples of successful development of promising types of services in the insurance market—the provision of services through insurance cooperatives or mutual insurance societies, which are better known in international practice. Cooperative insurance is a universal instrument, which is now considered a relevant financial tool for risk protection. However, the development of this direction in the Russian market is lagging behind similar indicators of other countries. Based on the available practical experience of Russia, the authors determine the relevance of the study of cooperative insurance development.

2 Materials and Methods

During the study, we used the methods of system, structural, and system, as well as comparison and grouping.

The information base of the study includes the works of Russian scholars, normative acts, and the materials of the official websites on the Internet.

3 Results

In foreign practice, cooperative insurance is understood as the activity of insurance organizations with the organizational and legal form of a consumer (insurance) cooperative. Insurance cooperatives or, as they are commonly called, mutual insurance societies account for a significant part of the insurance market (Fatkhullina et al. 2005). For example, mutual insurance in Austria accounts for 60.5% of the local insurance market, in Finland—more than 49.7% (Table 1). According to statistics, in the reporting year of 2017, mutual insurance market services were marked with high

Table 1 Level of mutual insurance in 2017

Country	Share of mutual insurance in the insurance market of the country, %
Austria	60.5
France	49.7
Sweden	47.6
Germany	47.0

Source Compiled by the authors

development dynamics and accounted for 26.7% of the total turnover of the global insurance market.

The funds of mutual (cooperative) insurance companies reach $1.2 trillion. The companies employ up to 1.1 million people, serving 915 million policyholders (Khamitov 2015). During their activities, cooperatives and mutual insurance societies create voluntary societies and unions for exchanging information and protecting joint projects and professional interests in the international market. The international practice has several examples of the successful functioning of insurance associations. For example, the International Federation of Cooperative Insurance (IFCI) includes cooperative organizations of insurers from 37 countries to develop international cooperation, including insurance services and reinsurance among its members. The IFCI organizes training for specialists and provides organizational, technical, and material support in the formation of the structure of cooperative insurance, especially in developing countries.

In Russia, cooperative insurance actively developed in different directions (Khorin and Brovkin 2018):

- County insurance;
- Mutual insurance against fires in counties and cities;
- Governmental provincial insurance;
- Branch mutual insurance;
- Mutual insurance in the Cossack army;
- Mutual army insurance;
- Mutual insurance of buildings of the spiritual department.

Cooperative insurance was most effective in the agricultural sector—crop insurance against hail, cattle and horse insurance against mortality. During this period, mutual insurance was characterized by a high level of state support (Majuchowskii 2014).

After the October Revolution, insurance was nationalized along with the entire financial sector.

In 1918 the USSR established the All-Russian Cooperative Insurance Union. Cooperative insurance as part of financial cooperation existed along with labor, production, trade, consumer, housing, and social cooperative activities.

Financial cooperatives in the form of a cooperative bank, credit union, and insurance cooperative were managed by members (clients, borrowers, depositors, and insurers) and provided banking and financial intermediation services. Insurance cooperatives allowed their members to receive insurance services on favorable terms.

Insurance cooperatives were allowed to insure the property from natural disasters and independently establish types of insurance services, rates, and other insurance conditions since 1921. Since 1921, the insurance section of the Centrosoyuz carried out universal insurance for consumer cooperatives. All-Russian Cooperative Insurance Union (Coopstrakhsoyuz) insured agricultural, industrial, housing construction, and other cooperation types. All-Ukrainian Cooperative Insurance Union (Ukrkoopstrakh) was engaged in insurance of cooperative unions and associations of Ukraine (Insurance business in Russia from ancient times to the present day 2008).

However, cooperative insurance ceased to exist by 1931, and insurance services in the USSR were transferred to two monopoly companies—Gosstrakh and Ingosstrakh.

The Law "On Cooperation in the USSR" adopted in 1988 gave impetus to a new stage in the development of cooperative insurance. It allowed various organizations and unions of insurance associations to form cooperative insurance organizations and independently establish the conditions and types of the provided insurance services. In the same year, there appeared the first non-state insurance company ASKO in the form of a cooperative. In 1989, the organizations ASKO, Progress, and Center Reserve formed the first insurance union (ASSO) (Gracheva and Boltinova 2013).

Federal law "On Mutual Insurance" (November 29, 2007 No. 286-FZ) is an important regulatory act defining the specifics of the legal status of Russian insurance unions and the conditions for their operation. This Federal law also replaced the notion of insurance cooperative with the term consumer society of mutual insurance. Agricultural insurance cooperatives could fully operate in Russia until 2021. However, after 2021 (following the aforementioned Federal law), these cooperatives must obtain a permit for their activities (i.e., a license for mutual insurance) or cease their legal existence.

The share of mutual insurance in the Russian insurance market is insignificant and incomparable with that of the other countries. Thus, 11 mutual insurance companies collected only 0.08% of the total premiums of Russian insurers in 2020 (Fig. 1).

At the same time, 96% of total insurance premiums on the Russian mutual insurance market are premiums paid by the Consumer Society for Mutual Insurance of Civil Liability of Developers. This confirms the low level of development of general mutual insurance and its various types (except for civil liability insurance of developers).

Insurance cooperatives and mutual insurance companies have the following common features:

1. One purpose—insurance of property interests of its members;
2. Joint and several subsidiary liabilities of members of both associations;
3. Independence in setting insurance rates.

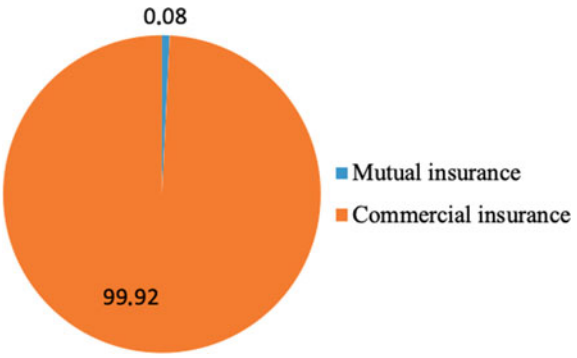

Fig. 1 Share of mutual insurance in Russia, %. *Source* Compiled by the authors

Nevertheless, there are fundamental differences between an insurance cooperative and a mutual insurance society. They are as follows:

1. Property of a cooperative is created at the expense of the property contributions of its members; it is divided into shares and income. In a mutual insurance company, the property is not divided into shares;
2. Profits from the business activities of the cooperative are distributed among its members, which is an additional incentive to join the cooperative. The net profit of a mutual insurance company may not be distributed among the members of the company and must be used only for statutory activities (Federation 2007).

Thus, the differences between such organizational and legal forms as a consumer society of mutual insurance and an insurance cooperative (when they provide insurance to their members) are based not on the method of providing insurance services but on the distribution of capital of these organizations into shares and the rights of members of each of these organizations to receive payments other than insurance compensation.

Let us look at some of the advantages of mutual insurance over commercial insurance:

1. Mutual insurance societies do not pursue the goal of making a profit (i.e., they are not commercial organizations). Mutual insurance society is an organization of mutual assistance for the division of damage among its members in order to provide them with effective insurance protection;
2. Insurance fund of a mutual insurance company remains in the ownership of its members. It can be placed in the financial markets to receive investment profits or be used to finance measures to reduce the risks of insured people.

Thus, the comparative analysis has shown that mutual insurance has properties that allow it to become a full-fledged participant of the Russian insurance market, along with commercial insurance. This statement is confirmed by international experience in the development of insurance.

The main problems in the development of mutual insurance on the Russian insurance market are as follows:

- Lack of state support for mutual insurance companies (at least at the stage of their formation);
- Difference between Russian and international insurance legislation, which affects the integration of the Russian insurance market into the global economic space;
- Impact on the activities of mutual insurance companies by commercial insurers, whose insurance portfolio and premium volumes are considerably higher than those of non-commercial forms of insurance protection. According to the Russian register of insurance organizations of the Bank of Russia, in 2020, there were only 11 (6.4%) registered mutual insurance companies with an insignificant financial turnover against 161 commercial insurance companies (Media Information Group "Insurance Today" 2020);
- Insufficient awareness of the population about the activities of mutual insurance companies;

- Current state of socio-economic development of Russia, which entails a low level of solvency of insurers.

At the same time, there are positive trends in the development of mutual insurance: market liberalization, recent attempts to improve legislation, increased interest of the scientific community in this topic, popularization of mutual insurance, etc.

Thus, Russia has all the conditions for developing consumer mutual insurance societies. This is facilitated by the presence of successful practice of mutual insurance societies and insurance cooperatives in Russia, whose history dates back to the seventeenth century (Nazarova and Khozhainov 2013).

4 Conclusion

International experience shows that cooperative insurance can exist along with mutual insurance societies and provide substantial assistance to the country, taking on the functions of compensation for damage. Insurance cooperation is most effective in agriculture, which is most exposed to various risks, including natural and climatic. Insurance cooperation in agriculture provides insurance services for crops, property, as well as personal and medical insurance.

The study reveals the main problems hindering the development of mutual (cooperative) insurance in Russia, namely imperfect legislative framework, lack of state support, pressure from commercial insurers, and lack of public awareness of such form of insurance as mutual (cooperative). These internal problems can be solved with effective government regulation.

In Russia, the development of cooperative organizations operating in various spheres, including insurance, requires regulatory, organizational, methodological, and financial support from the government. It is necessary to consider the domestic historical and international experience in the organization of insurance cooperatives and mutual insurance societies. Such measures will promote the creation and development of cooperative associations (unions, associations) at the international, regional, and sectoral levels. Moreover, it will allow cooperative insurance to integrate into the international economic space.

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Recommendations on the Development of Commercial Enterprises Supplying Rural Settlements in the Agryz District of the Republic of Tatarstan

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Abstract The research relevance lies in need for continuous sustainable development of rural areas of the Republic of Tatarstan to ensure its economic well-being. One of the directions of implementing such an approach is the diagnostics and analysis of the sustainability of commercial enterprises providing rural settlements in the Republic of Tatarstan districts, for example, in the Agryz district. The importance of this issue is due to the scientific support of the establishment and effective operation of industries in the Agryz district. First, it is important to study the unique conditions of the formation of commercial enterprises and track their work to obtain complete information about their activities in rural settlements. The next task is to change the ways to promote their socio-economic stability and productive development as an important stage of forming the prerequisite for self-optimization of the rural trade network. Another important milestone is the development of the most promising logistics routes for the movement of products, conducting marketing research to improve the assortment strategy and develop a sustainable supply of the population with the necessary amount of goods and services (what is now important in the assortment of rural stores, what is the maximum set needed). Based on the analysis of the demographic situation, paying capacity of the population in the Agryz district, the provision of stationary commercial companies in natural units, and the total area of commercial facilities per 1000 people, the authors recommend the government of the district and owners of commercial enterprises to make some changes.

Keywords Republic of Tatarstan · Agryz municipal district · Rural settlements · Trade · Commercial enterprises · Shops

JEL Codes O120

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1 Introduction

The Agryz municipal district is a part of the northeastern region of the Republic of Tatarstan. The area of the Agryz district is almost 1800 km^2. The Agryz municipal district consists of 71 settlements united into one urban and 21 rural settlements.

The leadership of the district is trying to create the necessary standard of living for the population. This is reflected in social and cultural programs and grant support for entrepreneurs in the district. The availability of goods and services is an additional factor in developing and improving the living conditions of rural residents. This research aims to implement such an approach.

2 Materials and Methods

During the research, the authors analyzed a wide variety of factors affecting the availability of goods in the district. These factors are as follows:

1. The territory and features of the Agryz district of the Republic of Tatarstan;
2. The residents of the Agryz district of the Republic of Tatarstan;
3. The activities of commercial enterprises of the Agryz district of the Republic of Tatarstan.

Moreover, the authors make conclusions and suggestions for improving the activities of commercial enterprises of the Agryz district of the Republic of Tatarstan.

3 Results and Discussion

Based on the results of the research, the authors present recommendations and conclusions.

3.1 Study of the Territory and Features of the Agryz District of the Republic of Tatarstan

The Agryz district has 71 settlements united in one urban and 21 rural settlements. According to the available data, in the Agryz district, crops in farms of different categories occupy a total area of about 1080 km^2. The percentage of total sown area of crops of different categories in the Agryz district from the total area of Agryz municipal district is 60%. This fact explains the need for a complete study of the activities of commercial enterprises in the district since, according to the structure

of the territorial distribution, the Agryz district can be referred to as the agricultural districts.

The transport network of the Agryz municipal district is 291 km, which is a low indicator compared with other districts of the Republic of Tatarstan. However, it is important to keep in mind that the length of local public roads with paved surfaces is 89%. This data is also necessary to create a plan of recommendations for the operation of retailers in terms of logistics and costs of transporting goods.

Next, the authors analyze commercial enterprises serving rural settlements. According to the Federal State Statistics Service (Rosstat), the Agryz district is provided with the area of stationary shopping facilities by 80%.

Nevertheless, for some rural settlements, this indicator is exceeded by more than 1.5 times. The same trend is observed in the city of Agryz. The existing over-regulation of stationary commercial enterprises explains why these facilities are not attended by the population and the losses emerge.

According to the order of the Ministry of Industry and Trade of the Republic of Tatarstan (October 7, 2016 No, 259-OD), in the Agryz district, the minimum provision of the population of the Republic of Tatarstan with the area of stationary commercial enterprises (m^2 per 1000 people) is 336.8 m^2 per 1000 people.

According to Table 1, the Agryz district is over-provided with stationary commercial facilities in physical units, namely, by 117.4%.

However, during the analysis of the total area of stationary commercial enterprises, the data obtained looks quite different. Thus, according to calculations of the total area of stationary commercial enterprises of the Agryz district, there is a shortage of retail space at an average of 51.4 m^2 per 1000 people.

At the same time, the indicators of the average level of wages and the number of non-disabled people in the Agryz district, as well as the presence of private subsidiary plots in the majority of the rural population, require a particularly careful attitude to the proposed range of food products sold by commercial enterprises in rural settlements.

Based on the results of the conducted analysis of the territory of the Agryz district of the Republic of Tatarstan and territorial distribution of commercial enterprises, the government of the district is recommended to adhere to the number of trade enterprises and their occupied retail space for each settlement as established in the order of the Ministry of Industry and Trade of the Republic of Tatarstan (October 7, 2016 No. 259-OD).

3.2 Study of the Number of Registered Residents of the Agryz District of the Republic of Tatarstan

The number of people registered in the Agryz district is 49,727 people as of January 1, 2020. On January 1, 2020, the number of urban residents was 34,724 people, and the number of the rural population is 15,003 people. According to the Rosstat regional

Table 1 Provision of the population with stationary commercial enterprises

	Name of the rural settlement	Population as of January 1, 2020	Provision of the population with stationary commercial enterprises, units			Provision of the population with stationary commercial enterprises, units		
			Natural units			Area, m^2		
			Norm	Actual	%	Norm	Actual	%
1	Azevskoe	470	4	4	100	158.3	104.3	65.9
2	Bimskoe	917	6	7	117	308.8	194.9	63.1
3	Devyaterninskoe	569	4	4	100	191.6	172.2	89.9
4	Izh-bobinskoe	953	3	3	100	321.0	68.7	21.4
5	Isenbaevskoe	874	4	5	125	294.4	350.0	118.9
6	Kadryakovskoe	432	2	3	150	145.5	74.6	51.3
7	Kadybashskoe	498	5	4	80	168.1	173.9	103.5
8	Kichketanskoe	848	6	7	117	285.6	319.8	112.0
9	Krasnoborskoe	1207	6	9	150	406.5	244.1	60.0
10	Kryndinskoe	718	4	4	100	241.8	125.2	51.8
11	Kudashevskoe	454	2	3	150	152.9	95.0	62.1
12	Kulegashskoe	415	4	5	125	139.8	135.0	96.6
13	Kuchukovskoe	966	6	6	100	325.3	226.4	69.6
14	Novobizyakinskoe	432	2	2	100	145.5	81.5	56.0
15	Salauschskoe	888	7	10	143	299.4	279.0	93.2
16	Sarsak-Omginskoe	577	4	2	50	194.3	75.9	39.1
17	Staroslyakovskoe	536	3	4	133	180.5	91.5	50.7
18	Starochekaldinskoe	258	2	2	100	86.9	102.1	117.5
19	Tabarlinskoe	596	4	5	125	200.7	231.1	115.1
20	Tersinskoe	2017	7	14	200	679.3	737.8	108.6
21	Sharshadinskoe	376	3	3	100	126.6	89,6	70.8
	Total	15,003	88	106	117.4	5053.0	3972.6	78.6

Source Compiled by the authors based on Rosstat

office of the Republic of Tatarstan, the urban population includes 3218 retirees, 2287 children of school and preschool age, and 9498 non-disabled people (Rosstat 2020).

According to statistics, the share of the working-age population is about 63.3%, which is an optimistic indicator in assessing the effectiveness of commercial enterprises.

However, it is necessary to assess the solvency of the population for a more detailed analysis. According to the Rosstat regional office of the Republic of Tatarstan Statistical Service, the average salary for different types of activities varied significantly in 2019 (Rosstat 2019).

The statistical data in Table 2 shows the picture typical for the Russian Federation. These statistics are consistent with the size of the subsistence minimum for the

Table 2 Employment and wages in the Agryz district

Indicators	Unit of measure	2019
Average number of employees of organizations (without small businesses) (2017); Average monthly salary of employees of the municipal organizations (2017)		
Total for the surveyed types of economic activity (101.AG)		
January–December	People	7094
Average monthly salary of employees of organizations (without small businesses) (since 2017)		
Total for the examined types of economic activity (101.AG)		
January–December	RUB	33,943
The average number of employees of municipal organizations (since 2017)		
Total for the examined types of economic activity (101.AG)		
January–December	People	1677
Average monthly salary of employees of municipal organizations (since 2017)		
Total by type of economic activity (101.AG)		
January–December	RUB	26,116

Source Compiled by the authors based on Rosstat (2019)

Republic of Tatarstan. However, the wages of most residents of the Agryz district remain insufficient for giving up personal subsidiary farming.

Thus, Fig. 1 shows the Rosstat data on the distribution of consumer spending of the population as of February 14, 2019. According to this data, the district residents spend more than 30% of their income on food. Therefore, in the context of an average family with two working adults, there are two children and one retiree of unemployable age. About 40% of the income of such a family will go on food. That is why most of the residents of the Agryz municipal district of the Republic of Tatarstan have their private households.

According to the Passport of the Agryz Municipal District of the Republic of Tatarstan, the number of private subsidiary plots of the rural population in the district is 8231 as of the 3rd quarter of 2020.

The above data indicates that almost 100% of the rural population have personal subsidiary plots, thereby partially providing themselves with some food products. In turn, this also has a negative impact on the development of trade in the Agryz district of the Republic of Tatarstan.

The analysis of the demographic situation in the Agryz district revealed the average wage and share of the able-bodied population. Based on the data obtained, the authors recommend that the government of the district introduce measures to support certain segments of the population in the age groups of 0–18 and 55–95 years.

Based on the analysis of the availability and functioning of private subsidiary plots of the residents of the Agryz district, the government of the district was recommended

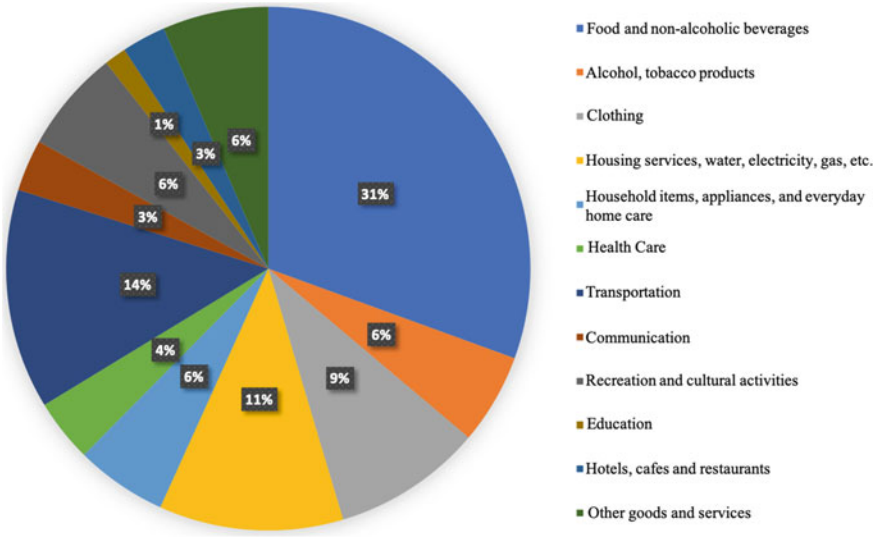

Fig. 1 Consumer expenditures of the population in % for the calculation of the consumer price index. *Source* Compiled by the authors based on Rosstat

to change the system of planning the activities of commercial enterprises in the direction of reducing the overall share of such enterprises in the economy of the district.

3.3 Analysis of the Activities of Commercial Enterprises of the Agryz District of the Republic of Tatarstan, Conclusions, and Suggestions for Improving Their Activities

As noted earlier in paragraph 3.2, the average per capita income (Table 2) in the Agryz district almost equals two subsistence minimums. Therefore, the idea of forming the proposed range of food products sold by commercial enterprises serving rural settlements based on the minimum food basket established by the Government of the Republic of Tatarstan remains reasonable (Rosstat regional office of Republic of Tatarstan 2019).

Based on the above data, it is possible to recommend an approximate range of goods for sale in the shops of rural settlements. The specified list of the minimum food basket established by the Government of the Republic of Tatarstan (Rosstat regional office of Republic of Tatarstan 2019) can be taken as the basis of the assortment list and revised as necessary (Table 3).

Table 3 Suggested assortment list per 1 month per 100 citizens

Code of products in the Classification of Individual Consumption According to Purpose	Name of groups and types of products (services)	Weight of products in kg per one month per 100 citizens
0	ALL PRODUCTS AND SERVICES	
01	FOOD AND NON-ALCOHOLIC BEVERAGES	
01.1	Foods	
01.1.1	Bakery and cereals	291.89
01.1.2	Meat	577.53
01.1.3	Fish and seafood	139.06
01.1.4	Dairy products, cheese, and eggs	308.88
01.1.5	Oils and fats	74.61
01.1.6	Fruits	136.67
01.1.7	Vegetables	147.36
01.1.8	Sugar, jam, honey, chocolate, and candy	144.59
01.1.9	Food products not included in other categories	45.26
01.2	Non-alcoholic beverages	105.71
01.2.1	Coffee, tea, and hot chocolate	69.27
01.2.2	Table water, soft drinks, and juices	36.44
02	ALCOHOLIC BEVERAGES, TOBACCO PRODUCTS	368.76
02.1	Alcoholic beverages	289.25
02.1.1	Strong drinks	119.23
02.1.2	Vine	92.19
02.2.0	Tobacco products	79.51

Source Compiled by the authors based on Rosstat regional office of Republic of Tatarstan (2019)

The authors recommend that stationary commercial enterprises serving rural settlements change the assortment of sold products and exclude from the food basket the products that villagers can provide for themselves through household plots.

To further reduce the costs of commercial enterprises, it is recommended to build logistics routes for the movement of products (Dementiev 2013, p. 6; Shumaev 2014, 2016) for a particular commercial enterprise serving a rural settlement. This work should begin with the formation of an assortment list based on the analysis of similar enterprises in the same area for at least one year. The next step is the search for

Table 4 Scheme for calculating the profitability of supplies

1	Total costs per haul/month, thousand RUB	=SUM(item 1.1, item 1.2, and item 1.3)
1.1	Fuel consumption/cost/month, thousand RUB	
1.2	Driver salary/month, thousand RUB	
1.3	Associated costs per haul/month, thousand rubles	
2	Costs of maintaining fixed assets/month, thousand RUB	=SUM(item 2.1, item 2.2, item 2.3, item 2.4, and item 2.5)
2.1	Cost of annual vehicle maintenance, including the purchase of tires/month, thousand RUB	
2.2	Taxes, social security, insurance, road tolls/month, thousand RUB	
2.3	Rent and maintenance of premises/areas/month, thousand RUB	
2.4	Car depreciation/month, thousand RUB	
2.5	Equipment purchase/month, thousand RUB	
3	Net profit of the enterprise/month, thousand RUB	Data from accounting statements
4	Profitability/month, %	=item 3/(item 1 + item 2)*100%

Source Compiled by the authors

the suppliers of products included in the assortment list. After selecting the best suppliers, it is necessary to proceed to the calculation of the profitability of supply. The recommended option is shown in Table 4.

Based on the proposed calculation, a particular commercial enterprise serving a rural settlement can analyze and assess the profitability of supplying products as one of the most expensive processes in the organization. Moreover, the enterprise can calculate the break-even point of supply, that is, the maximum distance of suppliers from the organization.

4 Conclusion

The analysis of the demographic situation in the Agryz district shows that the percentage of the able-bodied population in the district is 63.3%. However, the solvency of the population remains low. Virtually 100% of the rural population have personal subsidiary plots, thereby partially providing themselves with some food products. The current solvency of the population in the district negatively impacts the development of trade. In this regard, it is recommended that the government of the

district introduce measures of material support for certain segments of the population in the age groups of 0–18 and 55–95 years.

The Agryz municipal district is sufficiently provided with stationary commercial facilities in physical units; the excess is 17%. However, there is a lack of total retail space per 1000 people—51.4 m^2. The same situation is observed in the city of Agryz. The excess of stationary commercial facilities leads to the fact that they remain unattended by the population. Therefore, there occur losses. The presence of private households and the analysis of the solvency of the population of the Agryz district allow making adjustments to the assortment of products sold. This data should be considered when creating purchase lists for all commercial enterprises of the district.

Therefore, a study of the profitability of supplying products to various commercial enterprises of the Agryz municipal district and the universal scheme of calculations proposed in this research are necessary and useful. Additional factors of influence are the unique geographical location of the district, the specifics of territorial distribution, and the length of transport networks. These factors were considered when forming the approach to analyze the profitability of supplying products to various trade enterprises of the Agryz municipal district. Moreover, it is possible to automate trade facilities on a single IT-platform.

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Evaluation of the Efficiency of Investments in the Financial Market of Russia

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Abstract The purpose of the research is to determine the effectiveness of investments in the financial market. The work analyses the effectiveness of investment activities in the financial market, reveals positive and negative trends that affect the dynamics of investments and their effectiveness. We studied the dynamics of the values of stock indices by month, the volume of trading on the Moscow Exchange for the period, the structure of investments of individuals. The authors of the article note that the wide participation of citizens in investment activities, through the stock market, can be recognized as one of the promising areas that contributes to its effective development. According to the results of the study, the authors of the article revealed that the main direction of Russia's investment policy over the past decade was not the accumulation of domestic investments, but the orientation on borrowing foreign investments. As a proposal to increase investment efficiency in the Russian financial market, the authors consider the possibility of moving to a mass investment model and increasing the competitiveness of the studied market. The work concludes that, despite the positive results of 2018, the effectiveness of investments in the Russian financial market is difficult to recognize as effective. The information base is based on overview and analytical materials, statistical data, etc.

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JEL Codes G140 · G12

1 Introduction

The present time demonstrates that there are many issues related to effective investment in the financial market, which relate to the use of financial resources, finding the most profitable use of capital, etc. Solving these issues forces various participants in the financial market to find and disseminate the most optimal combinations and methods of using funds, turning the financial infrastructure into a model that corresponds to the peculiarities of the modern state of the system of needs of society. The key concept of financial market analysis, which has a significant impact on its investment activity, is its efficiency (Brown 2018; Jack 2019).

2 Methodology

The research methods used are: comparative, historical, statistical analysis, financial and economic analysis, sampling, comparison and others.

The basis of the research was the works of foreign domestic authors (Bent 2019; Voblaya 2017; Lucas 2019; Torkhova and Yuzvovich 2017; Yakovlev 2017) on the problems of assessing the efficiency of investments in the financial market, data from statistical collections and other sources.

3 Results

A study of the works of domestic and foreign authors makes it possible to determine that investments represent a long-term investment in order to increase capital, increase the profitability of companies, etc. (Bent 2019; Voblaya 2017; Lucas 2019; Torkhova and Yuzvovich 2017; Yakovlev 2017).

As the analysis of various sources shows, the main direction of Russia's investment policy over the past decade was not the accumulation of domestic investments, but the orientation on borrowing foreign investments. This trend is also observed in the financial market.

According to the concept of an efficient market developed by Eugene Fama, a professor at the University of Chicago, the information currently presented in the financial market is presented in price parameters, and therefore these market participants are not able to earn income exceeding the average level in the market.

Another important reason is the lack of undervalued or overrated tools. From the scientist's point of view, it should be noted that once prices begin to reflect all the information necessary for the efficient allocation of capital resources, the market can be considered ideal. In addition, the price of financial assets at the moment corresponds to their investment value.

In the concept under consideration, three degrees of efficiency of the financial market are distinguished: weak, medium and strong. Low efficiency assumes that the current values of the variables contain all previous information about the state of the object. With average market efficiency, current values reflect not only the past, but also all the information currently available. Strong—shows that the market cannot be beaten even with confidential information.

One method that can be used to analyze the weak performance of the financial market is to determine the presence or absence of the January effect, which is to drastically change the quotations of financial instruments during the period beginning on the last day of December and ending on the fourth trading day of January.

The January effect is the result of sales at the end of the year and allows you to achieve a number of goals: tax cuts, capital gains and improved reporting. Such a sale reduces the price of the share, but has nothing to do with its nominal value.

A study of the Russian financial market showed that the position of the MCXSM medium and small capitalization index decreased by 11.2%, and its dynamics are mainly negative; the RTS index grew by 8.1%, but the dynamics of its changes are unstable, there are sharp increases and drops.

The largest growth is observed in the MOEX index, which increased by 21.2%, and its dynamics are more stable than in the RTS index. The financial instruments included in this index are the most stable.

The dynamics of the indices under consideration shows that in January there is a significant increase in index values: in January 2018, the growth of the MOEX index amounted to 8.47%, the RTS index 11.08% and the MCXSM average and small capitalization index—2.54%; in January 2019, index values were 6.35%, 13.56% and 4.15%, respectively.

January values are peak for each of the three indices under consideration, so we can conclude that the Russian financial market has the January effect.

Taking into account this fact, as well as the above-mentioned problems of the Russian market, and its insufficient development, it is relevant to analyze the market for the presence of a weak form of efficiency.

For Russian investors, testing of the loan and stock markets for the presence of a weak form of financial market efficiency is relevant (Biryukov 2017; Gerasimenko 2018; Kudelya 2018). It is also worth noting that the weak form of financial market efficiency is mainly provided by oil and gas companies, as well as indexes of finance, metals and electricity.

A weak form of efficiency is present in the stock market if stock prices accidentally change over time. In this case, the yields of financial instruments will be characterized by the normal distribution and randomness of the wandering of financial market yields.

Market trading volume indicators demonstrate such volumes of transactions that were carried out in the primary and secondary exchange markets. They are often used to assess their liquidity in exchange markets, analyze the pace and dynamics of the development of these markets. Changes in transaction volumes can be compared with the dynamics of prices for financial instruments, which is the starting material for constructing forecasts of changes in the exchange rate of securities. Such indicators include: the volume of securities issue, the volume of placement, which is the total volume of securities that were acquired by investors, the number of exchange transactions concluded over a certain period of time and the turnover in securities sales.

For the period from 2012 to 2018. The total volume of trading on the Moscow Exchange increased 2.3 times, a significant part of this growth falls on operations with cash and currency. The volume of trading on the stock and urgent market of Russia is not so significant both in absolute and in relative ratio.

In such a way, it can be noted that on the Moscow Exchange there is some positive dynamics in the volume of transactions, most of which are short-term and related to the movement of monetary resources.

The activity of individuals in the stock market is one of the indicators that make it possible to assess the financial market and its development. According to the NAUFOR agency, since 2015, the Russian stock market has seen an increase in investment activity of citizens, during this period the total amount of funds allocated by citizens has more than quadrupled, exceeding the amount of 2 trillion rubles.

In 2018, the total amount of investments of citizens placed on brokerage accounts corresponded to 1.5 trillion rubles, the market value of assets that were acquired under an individual trust management agreement was 400 billion rubles, and the amount of funds in individual investment accounts was 120 billion rubles. The investment structure is dominated by investments made through brokers, a smaller amount is the assets of individual trust management, individual investment accounts are the least common option in the stock market for individuals.

Therefore, there is a positive dynamics in the market of financial activity of citizens; however, their share in the structure of operations in the financial market is insignificant. In 2018, the amount of investments in the stock market amounted to 40,670 billion rubles, the share of investments of individuals is 5%.

According to statistics, the structure of investments of individuals in the financial market of Russia consists of: acquisitions of shares and bonds of Russian and foreign issuers, investments in shares of investment funds and other sources of investment.

For investors using the services of brokers in the Russian financial market, investments in bonds are more common, the total share of which is 52%, distributed between Eurobonds, federal loan bonds and corporate bonds, a quarter of investments are in shares of Russian issuers, investments in cash are 7%. Among the investments located on trust accounts, bonds prevail, the total share of which is 75%, most of which falls on Eurobonds.

The structure of investments in brokerage individual investment accounts is similar to other brokerage accounts, but investments in Eurobonds are insignificant and

amount to 1%, and the share of operations with currency is also higher—20%. Individual trust management investment accounts are mainly characterized by investments in mutual investment funds—70%, as well as government loan bonds—15% and corporate ruble bonds—5%. It is worth noting that the structure of investments of individuals is dominated by the least risky instruments, that is, bonds.

The wide participation of citizens in investment activities through the stock market is one of the promising areas that contribute to its effective development.

At the moment, there is a positive trend in the participation of individuals in market trading, however, their participation is insignificant, and the insufficiently high efficiency of the financial market impedes its development.

An important indicator of market efficiency is its liquidity, which implies the ability to conduct extended trading, the ability to absorb large volumes of securities in a short period of time with small fluctuations in exchange rates and low sales costs.

According to Cbonds Group estimates, among the 261 issuers operating on the Russian stock market, the shares of eight companies have a high level of liquidity, 40 have an average level of liquidity, and the remaining 213 are low-liquid.

High liquidity is one of the signs of market efficiency, and also helps attract investment through the implementation of financial instruments.

The above study of the effectiveness of investments in the financial market provides an opportunity to determine an insufficiently high assessment of the process being analyzed. The financial market demonstrates indicators, the analysis of which makes it possible to determine that only in 2018 positive development trends began to be observed. The problem of financial market efficiency is particularly acute in the stock market, which is seen as an alternative to bank lending and centralized financing of the mechanism of concentration and redistribution of investment resources of a long-term nature. The development of the stock market in the future can serve as one of the factors for the development of the Russian economy, through attracting investment resources. The share of stock market operations in the structure of the financial market is the smallest, and despite the trend of their growth, this ratio does not change. Attracting investment resources is hampered by the low efficiency of the stock market, low liquidity and high risk.

In order to increase the efficiency of the investment process, it is possible to provide conditions for the transition to a mass investment model, to increase the competitiveness of the Russian financial market.

4 Conclusion

Summarizing the above, the stock market investment climate is not favourable and potential investors do not see it as an effective source of financial investment. Riskiness of financial investment leads to the fact that exchange transactions become more speculative, and investment transactions are supplanted. Moreover, the effective development of the financial market and investment is hindered by the high level of resource concentrations and the predominance of banking organizations in the

market structure. In order to improve improve the situation, a number of steps must be taken that can positively affect the investment climate of the Russian financial market.

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Application of the Information System "1C: Enterprise" in the Cooperative Sector of the Economy

Larisa V. Smolentseva, Ludmila A. Gainulova, Alfira M. Akhmedova, Guzel Z. Khabibullina, and Gulnaz R. Yunusova

Abstract In a market economy, the competitiveness of enterprises and organizations depends not least on the use of information systems and technologies. Good governance in any sector of the economy, including cooperation, requires the use of modern professional software (Georgiev, Proceedings from TEL 2014: International Conference "Language Semantics: Model and Technology." Kazan, Russia, pp 40–41, 2014). Today, the technological basis of entrepreneurship, based on the use of the Internet, inevitably leads to a new form of organization of interaction between manufacturers and consumers—electronic cooperation (Fakhertdinova and Chernova, Materials of the XXIV All-Russian Scientific and Practical Conference—United socio-economic, scientific and technical systems in modern Russia: problematic, travel solutions. Rostov-on-Don, April 15, 2020, pp 22–26, 2020). Examples of such interaction are multi-user forums, Wiki projects, Web conferences, social networks, collective blogs, and so on (Fakhertdinova et al., Publishing House of IP Ivanov Vladislav Alekeslavovich, vol 61–15, pp 97–101, 2020). With the development of network telecommunications, the use of specialized application solutions began to play an important information role for business and the economy. A unique tool that optimizes accounting, management processes for small firms and large corporations is the 1C: Enterprise platform, the basis on which configurations are created for end users, including in the cooperative sector of the economy (Improvement 2019). The article describes the results of research on the application of the 1C: Enterprise system, taken from the experience of promoting the software products of 1C in various areas of the economy.

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Keywords Information systems · Cloud information technology · 1C software applications · Remote desktop · Application of software · Industry-oriented software · Cooperative economy

JEL Codes L86 · M15 · C80 · D58

1 Introduction

The cooperative sector of the economy is one of the forms of economy in new areas of activity of enterprises engaged in the production of goods, material services (organizations, institutions, citizens), sale of agricultural products and consumer goods (Burdinov et al. 2016). To date, cooperatives of two basic types have been defined in the field of cooperation: production and consumer (Sunset to the supplier 2019). Modern information systems and technologies should be used to effectively manage these structures (Fakhertdinova and Bogomolova 2020). To do this, a special professional software is created, the purpose of which is to solve the issues of accounting, management, optimization, forecasting and planning of economic processes. In modern realities, one of the successful information corporate systems used to solve almost all tasks of accounting and management automation is the 1C: Enterprise system, which is a complex of application programs (applications) built according to the same configuration principles and on a single technological platform.

2 Methodology

The tasks of accounting and management at different enterprises may differ significantly depending on the type of their activities, the specifics of the products or services provided, the required level of automation (Potasheva and Potasheva 2020; Potasheva et al. 2020). It is impossible to have one universal program designed for mass use and meeting the needs of most enterprises (users).

Therefore, the combination of these needs forms the software product "1C: Enterprise" as a system of different programs. It should be borne in mind that the use of global networks and cloud technologies is now relevant, which allows you to reach a completely new level of enterprise management. Cloud-based online technologies "1C: Enterprise" are an area for storing and processing information that allows you to keep records from any client computer within any operating system. In this case, the concept of Remote Desktop arises, which provides the user with access to databases from any workplace. This solution saves resources on local computers, since all computing and processing processes occur on the cloud server. Such a service from the company "1C" was called "1C: Fresh" or "1C: Enterprise via the Internet." The most popular applications "1C: Fresh" for small and medium-sized businesses are: "1C: Accounting," "1C: Entrepreneur," "1C: Managing our company." If you

consider these applications from the point of view of the capabilities and convenience of functionality, then you can make a certain ranking in terms of the degree of demand for them among users.

The priority configuration "1C: Accounting" is a program for automation of accounting and tax accounting. For individual entrepreneurs who are not professionals in the field of accounting, "1C: Entrepreneur" is very suitable.

Next: The "1C: Company Management" application is popular for comprehensive automation and operational tasks of small and medium-sized businesses. It allows you to automate wholesale and retail sales, Internet sales, the provision of client services, service services, automation of simple production. For individual entrepreneurs, it is possible to submit reports directly from the interface of this program. The application "1C: Salary and Personnel Management" is relevant, which allows you to automate personnel accounting, HR management, as well as payroll. Thus, enterprises receive comprehensive automation within the framework of one online service. Other applications are available in 1C: Fresh. For example, 1C: ERP, 1C: Complex Automation, and 1C: CORP Accounting. The 1C: Fresh service allows you to use one or more applications at the same time, depending on the tasks and the selected tariff. It is convenient that the number of legal persons can be any and it is possible to set up remote access at the same time for many employees of different departments. For example, an accountant can provide remote access to an enterprise manager. In the 1C: Managing Our Company application, you can organize the access of the entire company with different settings so that the use of this solution is as effective as possible. This is convenient in terms of optimizing the work of departments.

In order to start working with the 1C: Fresh service, you need to select the appropriate application, make settings: enter the organization's details, type of main activity, and tax system. The database can be downloaded to the service by uploading it from the stationary platform "1C: Enterprise" (Fakhertdinova and Shibakova 2020).

The remote desktop of Remote Desktop is considered in the most widespread way for receiving broad access for users to the information system "1C Enterprise". This solution was developed on the basis of Microsoft technology, which allows to process data in different software, and the technology used is fully adaptive to any operating systems (Georgiev and Prokopiev 2015). These include not only Windows, MacOS and Unix, but also mobile iOS and Android (Fig. 1).

The Remote Desktop concept expands the understanding of information technology and gives the user more opportunities to solve professional problems.

The main benefits of remote desktop are:

1. the ability to work not only with the platform "1C: Enterprise," but also with other software applications (MS Office package, reporting programs, Internet banking, etc.);
2. the possibility to save on the performance and configuration of computers, since all software and other resources are on the hardware of the remote server. In this case, a normal terminal client is used as the local computer;
3. multi-user mode is available (all employees work in the same space);
4. a full-fledged workplace is provided;

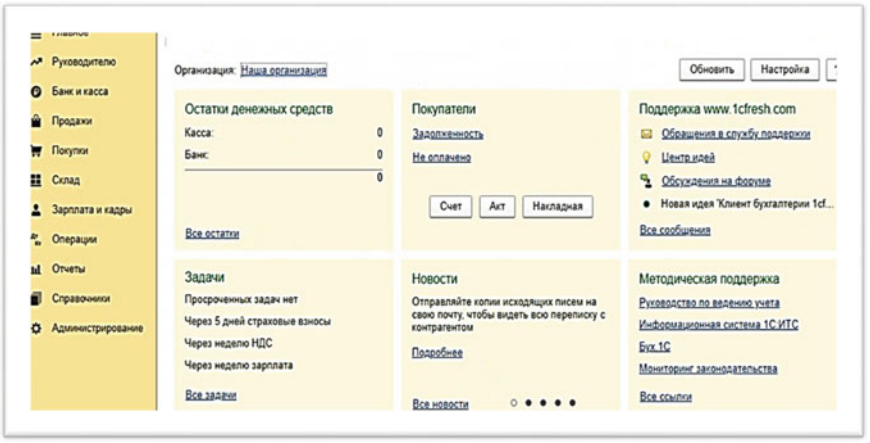

Fig. 1 Remote desktop of "1C: Enterprise" information system. *Source* 1C Applications

5. employees have access to all data stored on the server.

The main disadvantages of Remote Desktop are:

1. files stored on the server are available only from a specific application;
2. all work is performed in only one published application;
3. You must install additional software to configure the connection to the cloud information system.

3 Results

An accountant working in the cooperative sector of the economy often has to decide on the choice of a program that allows him to solve all his professional tasks. The priority is a convenient and understandable interface, full-fledged functionality, the ability to maintain databases for several enterprises at once. To date, such a solution can be attributed to the programs of 1C, namely, applications on the 1C: Enterprise platform. However, the specifics of working in the cooperative sector require the accountant to take a responsible approach to choosing the desired system configuration. An example is the version of VDGB: Accounting for Consumer Cooperation, which is designed for automated accounting in non-profit organizations conducting business based on consumer cooperation.

The accountant can also use the program complex "1C: Management of the credit consumer cooperative RAN PROF", designed for the integrated automation of accounting in organizations such as credit consumer cooperatives and agricultural credit consumer cooperatives in accordance with the current legislation of the Russian Federation and regulatory documents of the Bank of Russia. The programs "1C: Accounting 8 version of CORP" and "1C: Accounting 8 version of CORP"

Table 1 Comparative table of some features of the 1C: Accounting system of PROF and CORP versions (Enterprise Accounting configuration, revision 3.0)

No.	Description of functionality	PROF version	CORP version
1	Accounting and tax accounting, accounting and tax reporting	Available	Available
2	Support for common and simplified tax systems	Available	Available
3	Ability to use geographically spaced information bases	Available	Available
4	Web client capability	Available	Available
5	Multi-user mode, including support for three-tier client–server architecture	Available	Available
6	Simultaneous accounting for multiple enterprises in a single information base	Available	Available
7	Support for separate numbering of incoming documents by separate business units	–	Available
8	Separate accounting of expenses, income and actual profit for each business unit	–	Available
9	Automate the distribution of income tax by business unit, consolidate the reporting of value added tax	–	Available
10	Review standard reports by business unit. Realization of basic calculation capabilities under State contracts	–	Available
11	Possibility of end-to-end accounting in the context of enterprise divisions (both allocated and not allocated to separate balance sheets)	–	Available

Source 1C: Accounting CORP. Comparison of the functionality of 1C: Accounting versions of CORP and PROF

are also in great demand. Comparative characteristic of some functionality of the 1C: Accounting PROFESSIONAL version and 1C: Accounting of CORP version systems in the Accounts Department of the Enterprise configuration (version 3.0) is given in Table 1.

Today, 1C offers three supply options for the local version of 1C: CORP Accounting, as well as the online version of 1C: CORP Accounting in the 1C: Fresh cloud service.

Registered users of "1C: PROF Accounting" system can switch to "1C: CORP Accounting" version under condition of upgrade with discount with calculation of PROF version value.

Let us list the advantages of the online version "1C: CORP Accounting" in the cloud "1C: Fresh":

1. Cloud version "1C: CORP Accounting" can operate continuously in working mode without time restrictions. The application is always available from any territory of the planet where there is a connection to the global Internet. This allows users to process information at different points of access (except for the office including work at home, on vacation, on a business trip), which significantly increases the convenience of collective interaction of employees. You can

be at a significant distance from each other and at the same time work through the Internet with the same arrays of data in a single database.

2. There is no need to specifically purchase and install the program. You only need to have a stable connection to the Internet. Using the cloud-based online version of the 1C: CORP Accounting application, it is possible to work using any WEB browser.
3. Retraining of active personnel is not required. When working with the online version of "1C: CORP Accounting in the Cloud," the same "1C: CORP Accounting" is used, which, in terms of functionality and interface, completely coincides with the local version of the program, which is installed on user computers. Here it is possible to download all accumulated credentials from the local version of "1C: CORP Accounting" to the server and continue to work further as usual.
4. It is possible to send reports to the regulatory authorities according to the established deadlines. In this case, the electronic digital signature is also stored in the cloud and with the help of special Firewall software is protected from hacking attempts. Invoices and other electronic documents can be exchanged with counterparties.
5. All updates of the typical configuration "1C: CORP Accounting" with the creation of a new release of the program are made automatically and are already included in the cost at any of the tariffs. Therefore, you do not need to re-issue a separate ITS subscription (information technology support) to update the software product. As a result, documentation in electronic form on the 1C website is always relevant.
6. All data is stored and transmitted from the user's computer to the cloud server and back in encrypted packets, which provides high reliability and security. Information is stored in a modern secure DATA center, which guarantees 100% protection against unauthorized access, encryption viruses and other Internet threats.
7. Using the cloud version of "1C: CORP Accounting" allows you to significantly reduce the cost of supporting the IT infrastructure, since it is not necessary to purchase expensive local servers, to maintain, configure and administer them.

4 Conclusion

Software products based on the 1C: Enterprise information system were considered, which includes a platform and application solutions developed on its basis to automate the activities of organizations and individuals. Software solutions in the cloud service "1C: Fresh" and approaches to their use are considered.

A comparative analysis of the functionality of 1C: Accounting systems of PROF version and 1C: Accounting systems of CORP version 3.0 was carried out. Shows the main advantages and disadvantages of working with Remote Desktop.

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Sociological Research in Project Management

Irina I. Kondrashkina, Petr V. Manin, Roman R. Hairov, and Marina T. Zhussupova

Abstract The article presents the results of research on the socially useful activities of students of deviant behavior as a direction of project management in the implementation of youth policy in the region, as well as the main values in the project. The object of the research was the socially useful activities of students of deviant behavior. Currently, there is insufficient development of methodological and technological support for the organization of the prevention of youth deviation in the socio-cultural environment of the Republic of Mordovia, which makes it difficult to study the socio-useful activities of students and to purposefully implement the results through project activities. The relevance of this problem lies in the fact that project management allows coordinating the development of all social work with students. In this regard, a study of the problem of deviant behavior made it possible to determine the directions and tools of project management in the youth policy of the region. The article describes the conditions and factors of formation of deviant behavior of young people. Studies have shown that the result of the socially useful activities of students is a socially significant product of material or cultural property, which benefits not only society, the family, but also the child itself. It was shown that a weak level of awareness of the problems of socially useful activities reduces the innovativeness of project management. Practical recommendations on sociological research are made to ensure effective youth regional policy.

Keywords Social and useful activity · Trends of youth policy · Project management · Strategy · Deviant behavior · Sociological survey

JEL Codes C830 · I210 · R190 · M380 · O220

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1 Introduction

Project management is one of the tools for finding solutions to the problems of socially useful activities of studying colleges and universities. We proceed from the fact that the peculiarities of project management in regional youth policy are: time restrictions, orientation to social values, uniqueness—expectations alone, the result may be different. Hence, the factors of good governance are the qualifications and quality of interaction between people. People and interactions are more important than processes and tools (Kondrashkina 2020). Responding to changes is more important than following certain algorithms. It is possible to take into account changes and reduce the risk of uncertainty in youth policy projects through sociological research.

At present, such a problematic phenomenon as deviant behavior in young people is a behavior that deviates from the moral norms of society. Society is inevitably changing, social attitudes are changing, values, unfortunately, not always in the positive direction. As a result, there are deviations, deviations to which young people during professional definition are easily subject (Potemkina 2013). In order to analyze the socially useful activities of students of deviant behavior as a direction of project management of youth policy (based on the analysis of documents) determined the purpose of our research.

2 Materials and Methods

The theoretical basis of research was a comparative analysis of domestic scientific practices that characterize the system of effective organization of socially useful activities. In Russian science, the topic of project management is widely represented by different schools and different authors, in particular Polyakova N. A., Motovilova O. V., Donbass N. V. (Polyakov et al. 2020). The methodological base was compiled by general scientific and private scientific methods: expert survey, document analysis (qualitative), method of processing the results of the study, method of mathematical processing of data, generalization and interpretation of the obtained information. The empirical basis of the study was a qualitative analysis of documents, information published on the official website of state authorities, in the subdivision of the State Budgetary Institution "MRMTs" (State Budgetary Institution 2020), as well as on the website "Youth of Mordovia" (Youth of Mordovia 2020). An expert survey was conducted from among the staff of various structures. A total of 53 experts were interviewed.

Some aspects of the problem under study are considered in the work of Kondrashkina and Khairov (2019).

The authors also used the materials from Great Soviet Encyclopedia (Great Soviet Encyclopedia [Electronic Resource] 2020), Decree of the Government of 29.05.2015 No. 996-r "Strategy for the development of education in the Russian Federation for the period up to 2025" (Decree of the Government of 205.2015 No. 996-r 2020) and

Federal law of 31.07.2020 No. 304-FZ "About Introduction of Amendments to the Federal Law "About Education in the Russian Federation" concerning Education of Students" (Federal Law of 31.07.2020 No. 304-FZ 2020) in this study.

3 Results

We conducted a sociological research—The socially useful activity of students of deviant behavior. 53 experts took part in the sociological survey. The experts we interviewed were determined on the following basis: the presence of higher education, the experience of working with students for at least 5 years, as well as the scope of activity, scientific interests related to the socially useful activities of young people of deviant behavior.

At the place of work, respondents were distributed as follows: employees of the State Budgetary Institution "MRMC"—37.7%; employees of secondary educational institutions—18.9%; employees of State Budgetary Institution "Social Protection of the Population in the City of Saransk" in the Leninsky District—17%; employees of the Commission on Juvenile Affairs and Protection of Their Rights of the Republic of Mordovia in the Leninsky district of Saransk—3.8%; employees of "Saransk comprehensive boarding school for children with hearing impairment"—9.4%; employees of the State Committee of the Republic of Mordovia for Youth Affairs—9.4%; employees of the Department of the Ministry of Justice of the Russian Federation for the Republic of Mordovia—1.9%; employees of the State Budgetary Institution "Comprehensive Center for Social Services of the Population in Saransk"—1.9%. According to gender, the respondents were distributed as follows: women—68%; men—32%. By age, respondents were distributed as follows: from 25 to 35 years old—52.5%; 35–50 years—37.5%; from 50 years and older—10%.

Respondents rate as follows (on a 10-point scale): 1–3 points—9.4%; 4–6 points—20.7%; 7–10 points—69.9%. More detailed percentage for each specified score (Table 1). The role of socially useful activities in preventing the deviant behavior of students.

Respondents see the main reason for deviant behavior among young people in the environment (24.67%). Options such as parental behaviors, family relationships (23.37%) were also chosen; the general level of development of society (19.48%); educational errors (11.68%); misunderstanding of the values of love, friendship, courage, etc. (9.09%); underdevelopment, mental retardation (6.49 per cent); violation of the emotional sphere of the student (5.19%).

When analyzing factors that have a negative impact on students who have a predisposition to manifest deviant behavior, in the historical aspect, the respondents' answers were distributed as follows: the level and quality of life of the population (26.8%); value orientations of the population, level of social consciousness (19.4%); the presence of criminal groups, the level of crime in the country (17.6%); the political situation in Russia (13%); absence of conditions for organization of the student's

Table 1 Distribution of answers to the question "How do you assess the role of socially useful activities in the prevention of deviant behavior on a 10-point scale"

Point	%
1	0
2	5.7
3	3.8
4	7.5
5	3.8
6	9.4
7	13.2
8	15.1
9	17
10	24.5

Source Author's Sociological Research (2019)

free time (9.2%); State youth policy (7.4%); influence of foreign countries (4.6%); demonstration in cinema and on TV (1.8%).

When answering the question "Indicate the correspondence between measures and methods for solving the problems of social deviation of students," the respondents' opinions were distributed as follows: experts mainly identified the following areas of activity that most fully solve the problem of deviant behavior: the formation of a healthy lifestyle, volunteer activities, participation in the activities of public organizations, participation in projects of various orientations. Patronage of junior courses, labor and creative activity, increasing academic performance to a medium extent solve the problem. Socially useful work almost does not solve the problem of deviant behavior among adolescents (Table 2).

According to respondents, the following areas of socially useful activity have a stronger impact on the prevention of negative deviation: civil-patriotic (27.3%); cultural and leisure (23.4%); individual prophylactic (20.8%); sports and mass (15.6%); fitness (11.7 per cent); ecological (1.3%) (Fig. 1).

According to respondents, the root causes of the deviation among young people were distributed as follows: the influence of the street, the environment (30.4%); family situation (21 per cent); excess free time (13.4%); peculiarities of character, unstable psyche (12.6%); media, television (8.4%); the desire to prove something to someone and laziness, apathy for leisure activities gained the same number of opinions (6.7%); a role model, senior and authoritative friend (5.9%); failures in their own endeavors (3.4%); incompetence, errors of teachers (2.5%). None of the respondents chose the option of answering resentment to the actions of others (Fig. 2).

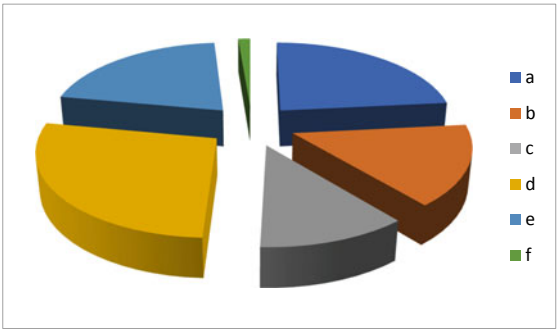
Respondents estimate the level of development of the deviant behavior prevention system in the Republic of Mordovia as follows: 1–3 points—11.76%; 4–6 points—38.23%; 7–10 points—50% powdered.

The level of awareness of interviewed experts about the existence of services that can be addressed to a student experiencing a dysfunctional situation in Saransk can

Table 2 Correspondence between measures and methods of solving problems of social deviation of children (according to experts), %

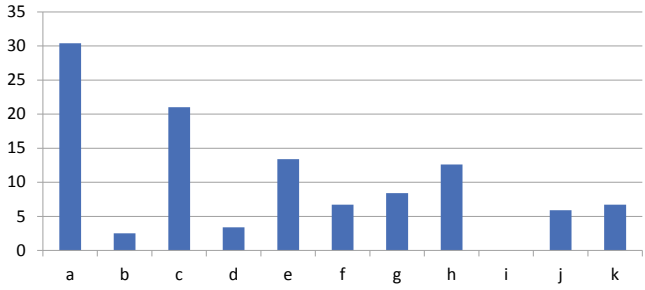
Social and useful activities	Fully solves the problem,%	Solves the problem on average, %	Almost does not solve the problem,%	Does not solve the problem at all,%
Employment	25.6	66.7	7.7	0
Socially useful activities	7.9	29	50	13.1
Improving academic achievement	28.2	51.3	21	0
Forming a healthy lifestyle	47.2	47.2	2.2	5.3
Participation in the activities of public organizations	35	65.7	5	2.5
Patronage of younger students. mentoring	0	52.6	23.9	0
Creative activity	29	55.3	15.8	0
Volunteer activities	23	61.5	0	2.6
Participation in various educational. social and cultural projects	29.7	61.2	8.1	2.7

Source Author's Sociological Research (2019)



Answer options: (a) cultural and leisure; b) mass sport activities; c) physical education and recreation; d) civil-patriotic; e) individual prophylactic; (f) environmental

Fig. 1 Distribution of responses to the question "Which direction has a stronger effect on the prevention of negative deviation?" %. *Source* Author's Sociological Research (2019)



Options for answers: a) the influence of the street, the environment; b) incompetence, errors of teachers; c) family environment; d) failures in their own endeavors; e) excess of free time; f) laziness, apathy for leisure activities; g) the impact of the media, television; h) character features, unstable psyche; i) resentment against the actions of others; j) the presence of an example of behavior of an older and authoritative friend; k) the desire to prove something to someone

Fig. 2 The distribution of answers to the question "What do you think is the root cause of the deviation in a teenager? Mark no more than three answer options". *Source* Author's Sociological Study (2019)

be estimated as follows: 80% of respondents said that they knew what services to contact, 20% of respondents did not know.

4 Discussion

Respondents noted the following measures that contribute to the prevention of deviant behavior: involvement in public activities (26.5%); work with the family and work with the student gained the same number of opinions (22.9%); involvement in volunteer activities (13.2%); organization of specialized camps and preventive work in them (9.6%); faculty activity (4.8%). 95% of respondents noted that the socially useful activities of young people of deviant behavior are the direction of social work, 5% of respondents do not agree with this statement. 87.5% of respondents believe that at present social work systematically and effectively solves the problem of correcting youth deviation through socially useful activities. 12.5% disagree with this statement.

The conducted sociological research indicated the current trends of project management in the youth policy of the subject of the Russian Federation. Educational institutions must quickly respond to all changes in modern and dynamically developing life: to develop an entrepreneurial culture among students, to stimulate and prepare them for entrepreneurial activity (Kondrashkina et al. 2020). Universities, colleges, youth associations are interested in ensuring that young people, in parallel with education, can engage in research and develop their own business projects, and then implement them in forums, competitions, conferences and other formats. As a result, socially useful activities focus on the development of personal competencies in the field of business and social development within the framework of project activities.

5 Conclusion

Therefore, it can be concluded that according to the results of the expert survey, the following main provisions were identified:

The socially useful activity of students of deviant behavior is the direction of social work. The implementation of this direction is the most important component of the prevention of deviant behavior.

According to respondents, the following areas of socially useful activity have a stronger impact on the prevention of negative deviation: civil-patriotic, cultural-leisure, individual-preventive.

Experts mainly identified the following areas of activity that most fully solve the problem of deviant behavior: the formation of a healthy lifestyle, volunteering, participation in the activities of public organizations, participation in projects of various orientations. The research results determined the strategic directions of project management in the regional youth policy.

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Integrated Report as a New Reporting Model

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Abstract The integrated report is a fairly new type of reporting for Russian companies, so the purpose of the research was to determine the main characteristics of the integrated report as a new reporting model demonstrating the sustainable development of the company, which is recommended to be compiled by consumer societies and unions. The research methodology is based on the use of the historical method, analysis of scientific and literary sources, synthesis, formalization, generalization and abstraction, systematization. The research examined the views of various authors on the features of integrated reporting, from which it follows that this is a new reporting model for business and government companies, focused on meeting the information needs of various stakeholders. When preparing this report, it should be taken into account that it should reflect: financial and non-financial information about the history of the company, about the strategy in the short and long term, confirming the sustainability of development. Sustainability should encompass economic responsibility to investors and consumers, legal responsibility to the State and the law, and ethical responsibility to society. An important component of the report is the demonstration of the integration of all aspects of the company's activities: production, social, environmental. The voluntary presentation of the integrated report contributes to the positive image of the company and makes it more attractive to all stakeholders, which today is important for consumer societies and unions. Harmonizing the work and information flows of individual company services is necessary to create and effectively operate the information support of the integrated reporting process.

Keywords Integrated report · Sustainable development · Interested users · Reporting

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1 Introduction

Any reporting is a set of indicators that characterize a particular aspect disclosed therein. Based on the needs of the persons for whom it is prepared, the presentation format and the rules for assessing indicators depend. All business entities compile financial statements, which are presented to external users and allow you to assess the performance of the entity, as well as characterize its financial condition. The problem is that the current user no longer has enough of this information to make a decision not only about investing in this organization, but also about the opportunity to cooperate with it. It should also be borne in mind that there has been a shift of emphasis from the material sphere to the intangible. Therefore, based on the information needs of stakeholders, the requirements for an integrated report were formulated. This type of reporting is quite new for Russian companies and raises many questions, some of which are related to differences in interpretations, terminology, translation of foreign words. Therefore, the aim of the study was to define the main characteristics of the integrated report as a new reporting model that demonstrates the sustainable development of the company and recommend that it be compiled by consumer societies and unions.

2 Methodology

In the process of preparing materials, general scientific and special methods of theoretical research were used. At the preliminary stage, a survey was conducted of managers and representatives of the accounting services of organizations wishing to prepare an integrated report. The survey showed that differences in terminology, translation of foreign words, the lack of a clear recommendation to compile this report, the need to independently determine the indicators disclosed create problems in understanding the essence and significance of this report.

Based on the fact that reporting, as a form of presenting information about a subject, is focused on constantly changing needs, the research was based on the historical method, analysis of scientific and literary sources, synthesis, formalization, generalization, abstraction, systematization.

The emergence of an integrated report can be attributed to the period of formation of requirements for reporting on sustainable development (Zimakova and Mussipova 2019). The next stage of evolutionary development is preparatory. At this stage, the International Integrated Reporting Council (IIRC) was established and the International Standard ISO 26000:2010 Manual on Social Responsibility (2010) was published. Its peculiarity is that it was prepared with the involvement of expert representatives of various stakeholders.

The third stage (2013) is characterized by formalization of requirements for integrated reporting in the form of a standard. Until 2013, the reporting format was quite diverse, some reports lacked the relationship between non-financial and financial indicators, and this raised a lot of questions. The International Integrated Reporting Committee (IIRC) has published the International Integrated Reporting Framework standard, which has been used in 25 States to inform financial capital providers.

Fourth stage (2014 to date) can be described as a stage of reporting in different countries. In 2014 At the XIX World Congress of Accountants in Rome, the International Council for Integrated Reporting announced its strategy to achieve global adoption of the International Framework for Integrated Reporting over the next three years.

The annual review of KPMG corporate responsibility shows a constant increase in the number of companies that make up social reports and the expansion of the scope of activities that they implement.

In 2015 65% of all companies in the 250 largest companies by revenue published information on the social aspect in the annual report and only a little more than half (52 percent) of large automotive companies did this. In Africa and the Middle East, only 30% of retailers accounted for social reporting. In 2017, 63% of the 100 largest companies (N100) and 75% of the Global Fortune 250 reported the application of the Global Reporting Initiative (GRII) reporting structure (The KMG Survey of Corporate Responsibility Reporting 2015).

There is also an increase in the number of companies that make up integrated reporting in Russia. In particular, according to the website of the Russian Union of Industrialists and Entrepreneurs as of November 2020. The national register includes non-financial reports of 195 companies, including 397 sustainable development reports, 370 social reports, 97 environmental reports and 264 integrated reports (National Register of Corporate Non-financial Reports 2020). It should be noted that the companies of the energy complex occupy the largest share among all Russian companies that make up integrated reporting, and oil and gas producers lead in the preparation of reports in the field of sustainable development and environmental reports.

The consideration of this type of reporting in most authors is associated with a clear distinction between the definitions of "integrated report" and "integrated reporting." The analysis of references and regulations, allows to define that the term "the integrated reporting" belongs to drawing up process, that is action for formation of indicators and data, and respectively the focus of a research is shifted towards the principles, methods, approaches and thinking, and "the integrated report" is a result, the result including information and it is necessary will focus on the concrete indicators, indicators opened in the report and forms of their representation.

The integrated report describes the company's performance. On the one hand, it contains information about the history of the company, on the other hand, about the strategy. It should be seen as a comprehensive presentation of information on the management of industrial, human, intellectual, natural and social capital, strategic goals and value creation, long-term vision, in the format of transparent and trustworthy, flexible, simple and expanded reports (Farrar 2011). At the same time, the

company's strategy, results and prospects should be presented in the context of the external environment (Kogdenko and Melnik 2014).

Malinovskaya N. V. in her definition of integrated reporting made, in our opinion, a very correct emphasis on systematized actual and forecast financial and non-financial information (Malinovskaya 2013).

Non-financial reporting is voluntary, but in some countries, such as France, Sweden, Norway, Denmark, Netherlands, Finland, certain categories of companies, such as government, must report on their performance in certain CSR areas and indicators.

An important issue in the consideration of the conceptual apparatus, in our opinion, is the term "integration," which in the context of an integrated report describes activities related to environmental and social sustainability, including current processes of acquiring, managing, making decisions, measuring and reporting related to the company's resources and ability to create values.

The philosophical encyclopedia defines that integration, from Latin integration—restoration, replenishment, from integer—whole, denotes the side of the development process associated with the unification of previously heterogeneous parts and elements into a whole (Philosophical Encyclopedia 2020).

According to Sroufe R., the term integration, in the context of integrated reporting, is the basis for vertical and horizontal harmonization of sustainable development activities (Sroufe 2017). Therefore, the report should disclose the internal factors of the company's sustainability determined by the management policy, while noting that all actions committed and planned do not harm the environment, corporate culture, etc. Thus, sustainable development should be consistent with all other aspects of the activity.

Using the term integration involves highlighting several related indicators that are disclosed in the report.

For example, environmental and human health, process safety and human health. Michael P. Krzus draws attention to the fact that the term "comprehensive reporting" does not fully convey the entity that integrated strategic thinking into integrated reporting. Modern companies work in a multidimensional world, in the world economy, the environment and society, in which they are important for the functioning of business. Corporate reporting that should reflect the real environment in the interaction of economic, environmental and social factors (Krzus 2011).

Developing this idea U. Yu. Roshchektaev very correctly noted that in order to compile this type of report it is necessary to proceed from integrated thinking, focusing on the relationship of the presented indicators (Roshchektaeva 2016).

N. Yu. Razuvaev emphasizes the importance of using not traditional "isolated thinking" when compiling integrated reporting, but a wider view of events and facts, which allows determining their impact on the ability to generate value in the future (Razuvaev 2017).

Integrated thinking is an active consideration of the relationship between different business units and functional units, which allows you to erase the departmental framework and consider the whole case. The addressees of this report, that is, the

persons to whom this report is intended, play an important role in the formation of integrated thinking.

The report should therefore be based on an integrated approach to the interrelationship of the diverse indicators reported.

The next important concept considered in the context of integrated reporting is sustainable development.

This requires managers to use new methods of organization and management. Sustainable growth is perceived as linked to innovation in sustainable development and value creation, which includes social value. Sustainability also entails a long history and alignment of the integration of sustainable development with strategic initiatives and long-term objectives. It should be understood that the term "sustainability" has clear relationships with the term "effectiveness".

Sustainable development in an integrated report is based on three principles: meeting human needs, ensuring social justice and complying with environmental restrictions.

The term "sustainability" covers four main factors of company behavior: economic responsibility to investors and consumers, legal responsibility to the state and the law, ethical responsibility to society, voluntary responsibility to society.

Effective management of the company involves social and public responsibility, reduction of harmful impact on the environment, steady growth of the organization and reduction of risks. At the same time, it is necessary to understand the industry specifics of the company, geographical location and national priorities. While, for example, for companies in Africa and Latin America, child protection policies are an important social aspect in relation to the possible exploitation of child labor, this issue is not relevant for European companies. In this case, the interests of clients, as stakeholders, are determined by the environmental and social component. Integration, in integrated reporting, should be seen as the basis for sustainable development and the ability to manage change, within the framework of value creation. That is, on the one hand, integration, this is the created basis, on the other hand, is the driving force for development and achievement of the goals set, within the framework of the formed strategy. When considering integration as an estimated factor, you need to change the attitude to the valuation indicators.

The prospect of growth is provided by integration, this is of fundamental importance for any company, because it connects the need for both vertical and horizontal harmonization of sustainable development initiatives. Organizations can use sustainability as a better criterion for balancing different aspects of business and society.

According to de Villiers C., Maroun W., the inconsistent use of terms suggests that the consideration of "sustainability" is often associated not with increased sustainability, but with the disclosure of information related to social and environmental sustainability and reflecting, for example, efficiency gains. "(Villiers and Maroun 2017).

Eccles R. G., Serafeim G. view sustainable development as a normative system of values, along with human rights, democracy and freedom, and call it a moral imperative (Eccles and Serafeim 2014). The need to report periodically to society on

sustainable development creates obstacles in disregarding compliance with certain rules by companies and individuals leading these companies.

E. A. Petrova emphasizes that the integrated report is intended for "interested parties," not just "users of reporting" (Petrova 2014). Prior to this, the most common term was precisely "reporting user."

Most often, the user is considered as a legal or natural person interested in information about the organization. The list of terms and definitions used in the rules (standards) of audit activity gives a similar definition, the user of accounting is a legal or natural person interested in information about an economic entity. Users of reporting can be classified according to various characteristics, depending on the tasks they solve, they identify the most significant indicators for themselves.

Today, even at the level of medium and small enterprises, there is interest in assessing the prospects for relations between counterparties. Of course, in some cases this is due to the desire to protect yourself in terms of reimbursing value added tax, but there is an increasing desire to work with one partner for a long time on understandable terms. Therefore, in integrated reporting, the first task is put forward not just to show dry numbers, but to disclose their content to persons using reporting data according to a certain algorithm.

Reports submitted on the website of the Russian Union of Industrialists and Entrepreneurs indicate disclosure of information to clearly defined stakeholders (whose interests prevail over others), for example, the presentation of social reports has an impact not so much on investors, partners and other business participants, but on the formation of the opinion of buyers (increasing its competitiveness) and the ability to attract employees, so the largest number of companies (311 companies) are social reports. The 64 companies that make up social reports are financial and insurance organizations, health and education organizations that also make up only this report, that is, they are organizations that are directly related to the population. The analysis of the submitted reports showed that the integrated reports contain digital information, which is represented by natural, value absolute and relative indicators. The format of its presentation allows you to understand it not only by a specialist, which cannot be said about financial statements.

Each of the earlier reports produced by companies characterized a separate direction and was directed to a certain group of users, which led to a certain subjectivity and infringement of the interests of other groups of users. Integrated reporting is designed to meet the interests of all stakeholders and provide competitive advantages both in personnel selection and in obtaining credit resources. And since the indicators are presented in interconnection, they allow you to give a comprehensive assessment and make the social, environmental business profitable.

Brown J., Dillard J. notes that business should not ignore climate change, resource depletion by disclosing additional information in integrated reporting related to technology improvements and business processes, the company gets the opportunity to benefit from environmental and social activities, which will make it more socially attractive (Brown and Dillard 2014).

Almost all authors are similar in opinion that an integrated report should reflect the value of the company taking into account the requirements of the century, that is, meet various information needs.

One of the most important tasks of integrated reporting is the reflection of retrospective and promising indicators of the activity of the business entity, which ensure the formation of a stable global economic model. This reporting is intended to make company information more transparent. Although no regulation governing reporting defines transparency as a principle.

Wild S., van Staden C. presented an empirical analysis of the content and structure of corporate summary reports compiled according to the requirements of integrated reporting published as of January 2013. They noted that not all reporting principles were clearly followed, there were difficulties in disclosing information on all types of capital (especially intellectual), as well as with an objective and reasonable assessment of the prospective nature (Wild and Staden 2013).

Russian groups of companies, holding associations represented at regional levels, are limited to compiling corporate reports, but it should be noted that on their websites today they disclose certain indicators of social and environmental activities, and some provide data indicating sustainability and development prospects. The conducted study, which involved business entities belonging to the Renna, EFCO, Capital-Agro groups of companies, showed that the lack of detailed information in in in-kind (sometimes value) meters makes it difficult to form many indicators that characterize their activities on the positive side, and do not allow to objectively determine the market value of companies and as a result assess the real financial results expressed through increment The main provisions of integrated reporting can form the basis of disclosed information on the websites of large business entities and groups of companies, which will make them more attractive to various stakeholders. All this will create the possibility of obtaining a synergistic effect (Zimakova et al. 2016).

3 Results

The study of the historical aspect showed that the integrated report appeared as a result of the evolutionary development of the interests of interested users, the composition of the indicators included in it is constantly supplemented, the number of companies that make up this report increases every year. The voluntary presentation of the integrated report contributes to the positive image of the company and makes it more attractive to all stakeholders, which is now important for consumer societies and unions.

When preparing an integrated report, it should take into account that it should reflect: financial and non-financial information about the history of the company, about the strategy in the short and long term, confirming the sustainability of development. Sustainability characterizes economic responsibility to investors and consumers, legal responsibility to the state and the law, ethical responsibility to

society. An important component of the report is the demonstration of the integration of all aspects of the company's activities: production, social, environmental.

4 Conclusion

The research examined the views of various authors on the features of the integrated report, from which it follows that this is a new reporting model for business and government companies, focused on meeting the information needs of various stakeholders.

An integral part of reporting is the information management system, an important issue for the creation and effective functioning of which is the harmonization of the work and information flows of individual services. Lack of consistency leads to loss of information or misinterpretation and, accordingly, to incorrect conclusions and decisions.

It is important to draw more attention of all user groups to the disclosure of not only production, but also social, environmental components of the activities of companies. Given the importance and relevance of the information accumulated in the integrated report, consumer societies and unions should be encouraged to compile similar reports and post them on their websites.

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Outsourcing as a Tool to Adapt Entrepreneurial Structures to the Spread of a New Coronavirus Infection COVID-2019

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Abstract The relevance of a subject of a research is caused by the fact that since the beginning of spread of new COVID-19 coronavirus infection, the condition of world economy considerably changed. The International Monetary Fund stated that spread of new coronavirus infection of COVID-19 provoked the most large-scale crisis in world economy since the Great depression (https://www.interfax.ru/business/703400). The analysis of world practice of use of technology of outsourcing showed that outsourcing develops and transformed in connection with active development of modern technologies and the fast-changing situation in Russia and the world in general. In the present article results of the analysis of current state of enterprise structures are given in Russia taking into account the current situation caused by distribution by new coronavirus infection of COVID-19. The carried-out analysis allowed to estimate influence of spread of new coronavirus infection (COVID-2019) on enterprise structures. During the research the problem which enterprise structures at adaptation of the business to the current conditions faced was revealed. Businessmen found out that they have no sufficient level of skills and experience for personnel management of enterprise structures at a remote format of work that affects efficiency of activity of enterprise structures in general, and in a row a case leads to its general decrease. Insufficient level of readiness of enterprise structures for transition to a remote format is able to afford to compensate outsourcing use.

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The mechanism of optimization of activity for adaptation of enterprise structures to the current situation in Russia—transfer of separate non-core business processes on outsourcing is offered.

Keywords Outsourcing · Entrepreneurial structures · COVID-19 · Business processes · Entrepreneurship

JEL Codes L25 · L26 · M11

1 Introduction

In connection with the spread of a new COVID-19 coronavirus infection, most of the entrepreneurial structures in Russia are now operating in a mode of serious restrictions. To preserve business, entrepreneurs have to pay close attention and prioritize management decisions regarding the management of the resources of entrepreneurial structures. As a rule, to stabilize the situation, entrepreneurs primarily resort to cutting costs and production, which can lead to crisis staff reductions. But now, more and more entrepreneurial structures are trying to apply mechanisms to reduce costs that can make it possible to comprehensively increase the productivity of their activities. Such mechanisms include the use of modern forms of labor organization, intensification of the production process based on the optimization of the use of production capacities and resources, restructuring of the management system and planning of business processes. However, now entrepreneurial structures most often began to introduce outsourcing into activities, as one of the tools to increase the productivity of entrepreneurial structures.

In connection with the spread of a new COVID-2019 coronavirus infection, the need to optimize its costs without compromising business was felt by entrepreneurial structures in Russia. The introduction of quarantine and a total drop in demand in certain industries and business areas led to the fact that many small entrepreneurial structures could not cope with this and survive the crisis. The current difficult economic situation encourages entrepreneurial structures to delegate certain non-core business processes to professionals. The advantages of outsourcing are that internal business processes become more manageable and transparent. At the same time, entrepreneurial structures can take advantage of all the capabilities of modern technologies, which they themselves do not have due to the specifics of its activities.

2 Methodology

The analysis of the current situation among entrepreneurial structures in connection with the spread of new COVID-2019 coronavirus infection of was carried out on the basis of research materials of the International Audit and Consulting Network of

"FinExpertiza", an analytical center of National Agency for Financial Studies. During the research, methods of a systematic approach were applied to study the impact of the spread of new COVID-2019 coronavirus infection on entrepreneurial structures, as well as general scientific methods of analyzing, synthesizing and comparing data.

An active scientific discourse is conducted on the topic under study in the work of Shinkareva et al. (2021), which determines the theoretical basis of this research.

3 Results

The international audit and consulting network "FinExpertiza" during the study revealed that by the beginning of August 2020, in Russia, over the previous 12 months, 10,954 thousand entrepreneurial structures were closed, among which were mainly entrepreneurial structures with annual revenues of up to 120 million rubles (https://finexpertiza.ru/press-service/researches/2020/zakrylsya-million-predpriyatiy). During the same period of time, 848.5 thousand new entrepreneurial structures were registered in the country.

The analysis revealed that the total number of entrepreneurial structures decreased by more than 240 thousand entrepreneurial structures, including entrepreneurial structures with annual revenue of up to 120 million rubles decreased by 4.3%—to 5350 thousand, and entrepreneurial structures with annual revenue of up to 800 million rubles—by 3.3%—to 218.5 thousand (Fig. 1).

In all but two constituent entities of the Russian Federation, the number of discontinued business entities exceeded the number registered to start entrepreneurial activities. The most negative dynamics compared to last year to reduce the number of

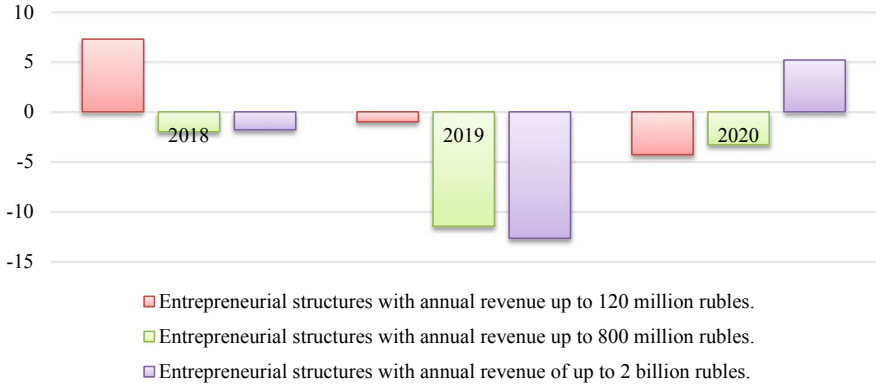

Fig. 1 Dynamics of growth and outflow of entrepreneurial structures in the Russian Federation. *Source* https://finexpertiza.ru

entrepreneurial structures was revealed in the Perm Territory (less by 7.6 thousand entrepreneurial structures—7.5%).

The largest number of discontinued business structures for the year was revealed in the city of Moscow, the city of St. Petersburg and the Krasnodar Territory (Fig. 2).

The minimum reduction in the number of entrepreneurial structures at the end of the year was recorded in the Leningrad Region (+172 entrepreneurial structures), in Chukotka (+23 entrepreneurial structures), in the Nenets Autonomous Okrug (−5 entrepreneurial structures), in Altai (−339 entrepreneurial structures) and Tyva (−354 entrepreneurial structures) (Fig. 3).

The author believes that this may have been influenced by a decrease in consumer demand and the introduction of restrictive measures that were aimed at combating the spread of a new COVID-2019 coronavirus infection.

The National Agency for Financial Studies analytical center presented the results of a study on the impact of the spread of a new coronavirus infection of COVID-2019 on Russian business, conducted at the end of March 2020 (Study of the Analytical Center of National Agency for Financial Studies 2020). Already from mid-March

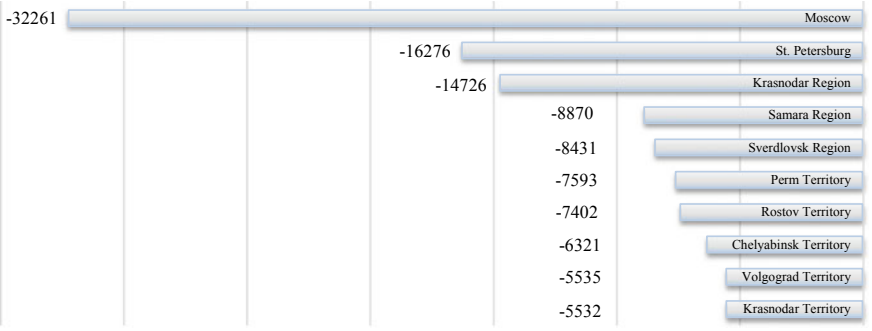

Fig. 2 Regions with the maximum absolute loss of entrepreneurial structures in the Russian Federation for the year. *Source* https://finexpertiza.ru

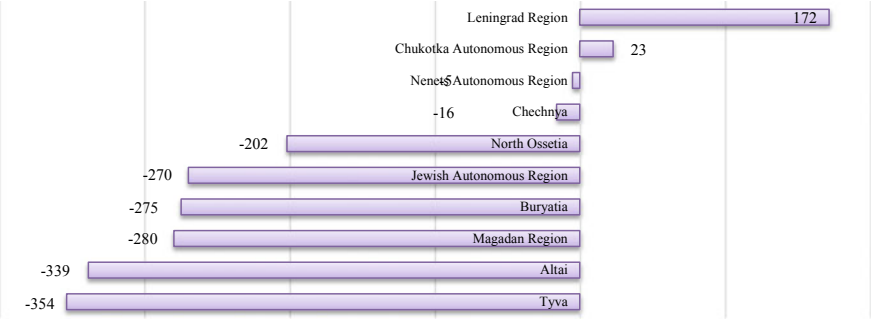

Fig. 3 Regions of the Russian Federation with minimum absolute loss or growth of entrepreneurial structures for the year. *Source* https://finexpertiza.ru

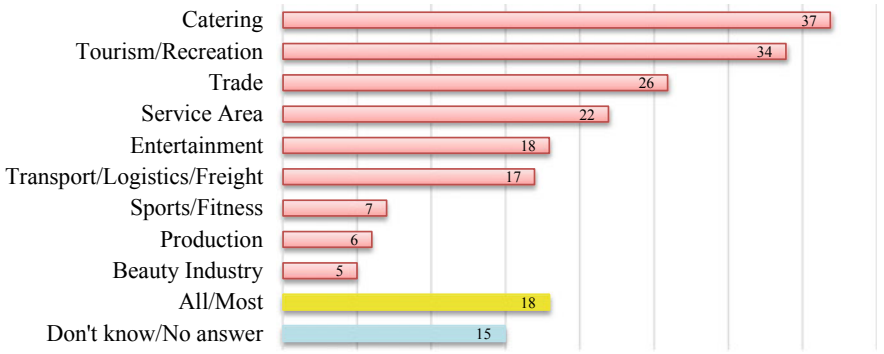

Fig. 4 Structure of affected areas from the spread of coronavirus infection (COVID-19) according to entrepreneurial structures, in% of all surveyed representatives of entrepreneurial structures. *Source* https://nafi.ru/projects/predprinimatelstvo

2020, Russian entrepreneurial structures began to experience difficulties in doing business and did not hope to improve the situation in the near future. Entrepreneurial structures asked the state to soften the tax regime and provide other measures to support small and medium-sized enterprises.

Most entrepreneurial structures (69%) believed that the impact of the spread of a new COVID-2019 coronavirus infection on Russian business will be as negative as possible (Study of the Analytical Center of National Agency for Financial Studies 2020). Representatives of business entities participating in the survey identified the most affected areas of catering and tourism, as well as trade and services (Fig. 4). At the same time, every fifth entrepreneurial structure believed that the current situation would affect all sectors without exception.

First of all, this affected entrepreneurial structures with annual revenue of up to 800 million rubles. The negative consequences were especially noticeable for entrepreneurs with a staff of up to 100 people (87%) (Study of the Analytical Center of National Agency for Financial Studies 2020).

The introduction of non-working days (Decree of the President of the Russian Federation 2020) and the self-isolation regime in the constituent entities of the Russian Federation forced entrepreneurial structures to quickly adapt to changes. Russian entrepreneurial structures began to minimize the costs associated with maintaining the staff. To this end, they began to send employees on vacation without pay, reduce their salary, cancel additional payments related to motivation and material incentives of staff (Fig. 5). Almost a third of the business entities transferred employees to a remote format, but most of them regarded this as a temporary measure for a period of self-isolation, including due to the low performance of employees in a remote format (Study of the NAFI Analytical Center 2020).

According to a survey conducted among entrepreneurial structures, it was found that every fifth representative of entrepreneurial structures (18%) was forced to resort to dismissal of employees. The largest indicator was recorded among the

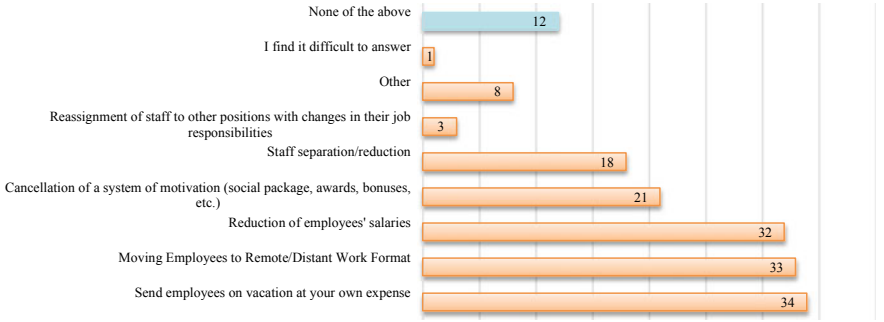

Fig. 5 Measures applied by entrepreneurial structures during the period of self-isolation, in % of all entrepreneurs surveyed. *Source* https://nafi.ru/projects/predprinimatelstvo

entrepreneurial structures of the hospitality and catering sectors (34% against 18% on average in other areas).

Also, during the study, the changes that occurred in entrepreneurial structures were analyzed in terms of staffing (Fig. 6).

A third of the entrepreneurial structures that took part in the study (33%) transferred employees to a remote format of work. Each third entrepreneurial structure (30%) transferred up to a quarter of the staff to a remote work format.

Most entrepreneurial structures (82%), which completely or partially transferred employees to a remote format, noted a decrease in employee efficiency. At the same time, every third business entity noted that the efficiency of employees has significantly decreased (Study of the NAFI Analytical Center 2020).

Fig. 6 Measures applied by entrepreneurial structures in the context of their staff, in % of all surveyed representatives of entrepreneurial structures. *Source* https://nafi.ru/projects/predprinimatelstvo

The author believes that it is worth noting that Russian entrepreneurial structures have not recorded an increase in the efficiency of employees when switching to a remote format of work.

According to the results of the study, it is possible to observe the greatest stability in plans to maintain the number of employees among entrepreneurial structures with annual revenue of up to 120 million rubles—among them 47% of entrepreneurial structures plan to reduce the number of employees. At the same time, 75% of companies planned to reduce personnel among representatives of entrepreneurial structures with annual revenue of up to 800 million rubles.

First of all, the reduction in the staff of entrepreneurial structures is associated with the minimization of costs to maintain their solvency. As an alternative to these measures, entrepreneurial structures began to actively introduce outsourcing technology and transfer certain non-core business processes to outsourcing.

According to the forecasts of the research company ReportLinker (www.reportlinker.com/p05912087/Digital-Logistics-Market-Research-Report-by-Function-by-Services-by-Industry-Global-Forecast-to-Cumulative-Impact-of-COVID-19.html) by 2025, the volume of outsourcing in the market will reach $114 billion with an annual growth rate of 5–6%. For entrepreneurial structures, outsourcing individual non-core business processes or even entire functions is an additional opportunity to increase the efficiency of the entrepreneurial structure and reduce its costs.

According to the authors' observations, as well as their research on this issue, entrepreneurial structures outsource individual business processes in order to save (36% of entrepreneurial structures) and attract missing specialists (45% of entrepreneurial structures) (Harvey Nash and KPMG 2020). For many Russian entrepreneurial structures, it becomes obvious that outsourcing in the current situation is no longer just a trend, but indeed a tool for optimizing their activities, which allows, on the one hand, to focus on key business processes, on the other hand, to improve the quality of products, work performed, services provided by attracting qualified specialists of a narrowly directed specificity of the activity.

The introduction of outsourcing helps, first of all, to improve the quality of products, works, services. This is realized by involving an outsourcing company in a business process in which the company specializes. In addition, this allows you to focus on the main type of activity of the entrepreneurial structure, since non-core business processes become the concern of the outsourcer, and the entrepreneurial structure directs the freed resources to the development of the main activity. As a result, the entrepreneurial structure improves the main financial indicators of key areas of activity, while at the same time non-core indicators increase. And this, in turn, allows you to increase the productivity, quality and profitability of the entrepreneurial structure as a whole.

4 Conclusion

An analysis of the current situation in the Russian Federation allowed the authors to conclude that today Russian entrepreneurial structures are faced with the problem of insufficient skills and qualifications necessary to manage business in current realities. The lack of staff management skills in a number of entrepreneurial structures in a remote work format affects and reduces the effectiveness of their activities. In addition, there is an insufficient level of readiness of employees of entrepreneurial structures to switch to a remote format of work. According to the authors, this is due on the one hand to the lack of capacity and technology to ensure the organization of work by their employees at the remote site, on the other hand to the lack of the necessary knowledge and skills of employees to work in a remote format (https://it-gramota.ru/).

As one of the tools to solve this problem, the authors propose the introduction of outsourcing to transfer individual non-core business processes to outsourcing companies. Today, outsourcing of business processes can become a serious competitive advantage. It allows you to reduce expenses, gain access to highly skilled personnel and advanced technologies, and focus on the main business processes of entrepreneurial structures.

However, the possibility of an integrated approach to outsourcing cannot be ruled out. Therefore, the current situation implies the adaptation of outsourcing companies themselves. The specificity of the activities of outsourcing companies allows us to expand the number of areas of services provided, as well as to provide a full-service cycle for entrepreneurial structures based on an integrated approach. According to the authors, this trend is a new form of interaction between entrepreneurial structures and outsourcing companies and requires further research.

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Intra-System Problems and Management Factors for Improving the Performance of Consumer Cooperatives in the Russian Federation

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Abstract This study aims to identify the intra-system problems and determine the prospects for their solution by influencing the managerial factors, with the ultimate goal of improving consumer cooperation activities in Russia. As a result, the study has proved that the intra-system problems are the main obstacles to the development of consumer cooperation in Russia. These problems include: (1) incomplete transparency of the national budget; (2) low efficiency and flexibility of the legislative framework; (3) strict state regulations; (4) inefficient dispute resolution legislation; (5) high corruption; (6) insufficient protection of property rights; (7) instability of state economic policy; (8) lack of the government responsiveness to changes; and (9) short-sighted government policies. On average, the favorability of intra-system parameters of economic regulation in Russia is at 48.8 points (low score). To address the identified issues, the study proposes a set of three applied recommendations for influencing management factors and optimizing state management of consumer cooperation activities in Russia. These include improving the regulation of conflicts of interest in the activities of consumer cooperatives, popularizing stakeholder-oriented management, and expanding the participation of Russia in the International Co-operative Alliance.

Keywords Cooperative member · Personnel · Consumer cooperation · Property of consumer cooperation · Mass organizational work · Transformation of trade network · Social mission

JEL Codes J54 · P13 · P36

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1 Introduction

The largest country by area, in our opinion, is bound to have a cooperative sector of the economy. This sector must be supported and encouraged by the state, thus contributing to the development of rural areas, production of strategic resources, and the improvement of the human potential of the country.

Rural regiments were especially successful in times of strife and struggle. Therefore, the current process of rural flight is strategically counterproductive.

In our opinion, the policies of forced settlement expansion via population relocation were a mistake. Young postgraduate scholars were also involved in these events, but not all were happy with the work.

This paper suggests that the main obstacles to the development of consumer cooperation in Russia are the intra-system problems, which can be solved by optimizing the government management of consumer cooperation activities. This study aims to identify the intra-system problems and determine the prospective solutions achieved by influencing the managerial factors of improving consumer cooperation activities in Russia.

2 Materials and Methods

The development of consumer cooperation has been covered in numerous scholarly studies (Arustamov 1987, 2001, 2019; Arustamov and Pigunova 2018; Arustamov and Pakhomkin 2009, 2019; Arustamov et al. 1984; Pakhomkin and Arustamov 2010a, b, 2011; Shagapova and Arustamov 2013; Valigursky et al. 2019). This study is based on the following:

- Evaluation of the current state of consumer cooperation;
- Comparative analysis of the recent activities of similar professional training organizations;
- Analysis of the competitiveness of cooperatives in a market economy;
- Assessment of rural settlement policies, regional development policies, and state support for rural settlements;
- Examination of real examples of cooperative enterprises.

Most current curricula in tertiary education institutions now lack externships at consumer cooperation enterprises. Quite often, students at these internships either worked as in-house staff or received training from upper-level managers. Losing such practices is quite a shame.

Not to mention personal examples, but a senior student in their last six-month internship (if they performed well) could even be appointed as an acting supervisor, while the staff supervisor (with consent) took a short leave of absence. And that was before cell phones, meaning that a young professional had to make decisions on their own (under the guidance of deputies, of course).

Unfortunately, mass organizational work with cooperative members has lost its functions. Now, in the best-case scenario, cooperative members gather once a year for a general assembly. Not all cooperatives take measures for recruiting new members and bringing the old ones into trade and production.

It is not uncommon to see citizens peddling vegetables, fruits, flowers, berries, jams, etc. The main reason for this is the passivity of consumer cooperatives, the main function of which is buying surplus produce from the population and selling at co-op stores with proper storage and sanitary conditions.

Procurement of surplus agricultural goods, concluding sales contracts, and helping with harvests were always the tasks of the consumer cooperation system. Young people were especially eager to get involved and remunerated for their labor and organizational skills.

3 Results

In recent years, under the guidance of the Council and the Board of the Central Union of Consumer Societies of the Russian Federation (Centrosoyuz), the work of regional consumer cooperatives intensified significantly. This was mainly achieved by using active methods of raising awareness, education, and promoting best activity examples. The weekly newspaper "Rossiyskaya kooperatsiya" performs a great deal of educational work.

The Center for Communication and Information of Centrosoyuz regularly holds online meetings of the new educational structure "Raipo Club" (District Cooperative Club) on the most important issues of consumer cooperation. Traditional online conferences on information planning are very useful since they tend to cover the best practices of cooperative organizations in the country.

Recently, Centrosoyuz intensified its experience exchange and the work on signing market expansion contracts (e.g., with the Corporation for Development of Small and Medium-sized Enterprises). Moreover, it organizes weekend fairs, develops delivery services to remote villages and small settlements. This gives hope for further sustainable development of consumer cooperation.

We analyzed public statistics data to identify intra-system problems and determine their prospective solutions (Fig. 1).

Figure 1 demonstrates that the institutional support for the Russian economy is moderately high. We identified the following intra-system problems that limit the development of consumer cooperation in Russia:

- Incomplete budget transparency (72 points) that obstructs government co-financing of consumer cooperatives;
- Low efficiency and flexibility of the legal framework (34 points) that does not reflect the newest tendencies of the cooperative sector or define the proper rules for it;

Fig. 1 Statistics of state regulation and corporate governance in Russia, 1–100 points. *Source* Compiled by the authors based on WEF data (World Economic Forum 2021)

- High burden of government regulation (37 points) that hinders overall economic activities, including consumer cooperation;
- Inefficient legal framework for dispute resolution (41.4 points) is especially harmful to consumer cooperation, which involves many stakeholders with conflicting interests and views;
- High corruption (28 points) and overall non-transparency of government regulations, which inhibits efficient consumer cooperation;
- Insufficient protection of property rights (44.7 points), which raises investment risks for cooperative members;
- Instability of economic policies (44.9 points) that causes high risks and uncertainty of prospects in consumer cooperation;
- Insufficient responsiveness of the government to changes (47.4 points), which lowers the attractiveness of consumer cooperation and its stability;
- Insufficient long-term vision of the government (51 points) that lowers the return on investments in consumer cooperation.

However, one of the positive features of economic regulation in Russia is a high quality of land administration (86.7 points).

Solving these intra-system problems requires influencing management factors of consumer cooperation: regulating conflicts of interest in consumer cooperatives (currently uncommon, 50 points) and applying shareholder management (moderately common, 73 points).

According to Centrosoyuz data (Centrosoyuz of Russian Federation 2021a), consumer cooperation is quite widespread (present in 71 out of 83 Russian regions) and includes about 2.3 thousand cooperative enterprises. Practical implementation of the proposed recommendations is linked to the wider participation of Russia in the International Co-operative Alliance (Centrosoyuz of Russian Federation 2021b).

4 Conclusion

We managed to prove the working hypothesis and confirmed that the main obstacles to the development of consumer cooperation in Russia are intra-system problems, such as the following:

- Incomplete transparency of the state budget;
- Low efficiency and flexibility of the legal framework;
- High burden of state regulation;
- Inefficient legal framework for the resolution of disputes;
- High corruption;
- Insufficient protection of property rights;
- Instability of state economic policy;
- Insufficient responsiveness to changes;
- Insufficient long-term vision of the government.

The average favorability of intra-system parameters of economic regulation in Russia is low (48.8 points). To address the identified issues, we proposed a set of three applied recommendations for influencing management factors and optimizing state management of consumer cooperation activities in Russia:

- Improving the regulation of conflicts of interest in the activities of consumer cooperatives;
- Popularizing stakeholder-oriented management;
- Expanding the participation of Russia in the International Co-operative Alliance.

The intensive development of a digital economy is to play an important role in improving intra-system parameters of economic regulation since it covers the fields of both government regulations and consumer cooperation. Nevertheless, this study did not dwell on digitalization issues due to the insufficient statistical basis of digital developments in Russian consumer cooperation. Guidelines for digital accounting in consumer cooperation require further research.

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Experience in Implementing International Cooperation in the Field of Drip Irrigation Modelling in Conditions of Water Scarcity

Vladimir P. Philippov, Marina V. Gavrilova, Viktor V. Alekseev, Alexey V. Rechnov, and Mirasil M. Mirzoev

Abstract As world practice shows, one of the most important criteria that significantly affects the development and growth of crops during their vegetation is the optimal moisture content in the basal layer. One of the main elements necessary to maintain the water regime of the soil at the optimal level is the determination of several determining parameters, which include, for example, setting the humidification depth of the basal system of a certain culture and maintaining a given moisture level at this depth. The frequency of watering is determined by the depth of humidification: as the depth of humidification increases, the frequency of watering decreases. For the most accurate determination, as shown by many years of experience in international cooperation, it is necessary to preliminary simulate the dynamics of soil moisture. This significantly reduces the costs associated with irrigation of the soil, while significantly improving the efficiency of irrigation. The role of modelling as an effective tool for pre-monitoring the implementation of soil irrigation on the scale of any market entity is growing annually, due to the need to ensure sustainable balanced agricultural development (Devika et al. J Rural Dev 36:293–310, 2017). At the same time, international cooperation in the exchange of experience and advanced information technologies plays an important role (Maksimov et al. Proceedings of the 30th international business information management association conference, IBIMA

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Keywords Drip irrigation · Numerical methods · Soil cover heterogeneity · Moisture profile

JEL Codes C02 · C32 · C93 · O13 · O14

1 Introduction

The current state describing the water supply of the Republic of Tajikistan is quite contradictory. As a result, the country's vast reserves of water resources, consisting of rivers, lakes of underground water systems and glaciers (i.e., more than half of all the resources of Central Asia) cannot meet the needs of the national economy (Albaji et al. 2015). Analysis of the situation shows that, along with such causes as demographic growth, urbanization, natural disasters in the form of flood villages, etc., inefficient use of water resources plays a significant role. If we consider agriculture, there are achievements that allow efficient and balanced use of the characteristics of regional landscape conditions in the implementation of reclamation activities (Muršec et al. 2018). However, we note that they are no longer the rule, but the exception, and in the republic regarding the issue under consideration, there is a considerable reserve for the introduction of resource saving technologies (Selim et al. 2013).

Currently available studies on drip irrigation are mainly aimed at describing the structural characteristics of irrigation systems, much less work on modeling the processes of water flow in the soil. One of the main problems in conducting drip irrigation of soil is the determination of geometric scales of moisture contours in the zone of growth and development of the basal zone of plants. Accurate data on the parameters of the humidity circuit make it possible to more efficiently provide the plant with water, fertilizers, etc., without additional costs. If, for example, spherical soil samples with diameters of 25 and 30 cm are considered, then taking into account a porosity of 50%, 4 and 7 L of water will be required to fill them with water. The difference of 3L is obtained due to the difference in the values of the radii of the spheres of only 2.5 cm. The figures are selected so that for clarity at least approximately describe the dimensions of the middle root system and demonstrate the differences in the use of optimal and suboptimal volumes of supplied water for watering. As a result, it turns out that the difference of three liters is more than 75% of the supplied four liters of water. At the same time, as shown by our many years of cooperation, the geometric parameters of the circuit can vary quite a lot and significantly depend on the parameters of the water (speed of movement, volume, quality indicators, the presence of fertilizers, etc.). Often, research is limited to the fact that they obtain regression dependencies for the shape of the contours. Research carried out by scientific organizations in the field of studying the separation parameters of

humidity circuits to ensure the necessary irrigation standards is often simply statistical in nature, which does not reflect dynamics. In some cases, the dependence of the volume of water supplied on the number of emitters and their location relative to plants is studied. At the same time, the following main factors are mainly taken into account: the percentage of initial soil humidification of the study site, the type of soil cover, the climatic zone, the permeability value and porosity for the site, etc. This approach is not always applicable to extrapolation of results for the same soils having greater compaction or a significantly mild state.

The intensity of watering, which exceeds the intensity of absorption of water by the soil, leads to the appearance of drainage waters, often leading to erosion of the soil (Alekseev and Maksimov 2018; Chuchkalov et al. 2020; Maksimov et al. 2019).

Since the activity of the agro-technologist involves making reasonable correct decisions, often in the presence of incomplete information, a method for predicting runoff using elements of fuzzy-logic or soft calculations (fuzzy-logic) together with cluster analysis (Alekseev and Vasilyev 2018) has been developed. The processing of information on humidity and precipitation in a particular territory over a long period of time allows you to divide the data into clusters characterizing the dynamics of humidity during the growing season. For the upcoming growing season, at first and the intensity of rains, using formulas for the probability of dependent events, you can determine the cluster to which this season is assigned. For statistically calculated rain characteristics from this cluster, using developed programs, surface runoff volumes are calculated. This allows you to correctly choose the technique for tillage and ensure erosion safe watering.

However, despite these and other unresolved problems, drip irrigation preserves the optimal water management of soils and is the most cost-effective and environmentally friendly method, demonstrating the need to optimize and implement remediation activities on a case-by-case basis. Science-based approaches implemented within the framework of international cooperation of scientists will significantly increase the effectiveness of reclamation activities and technologies, which will significantly reduce the impact of negative soil processes on irrigated land and significantly increase the stability of agricultural production.

2 Materials and Methods

Since the calculation of drip watering modes allows the dosing of water supply directly to the location of the root zone of crops. For these purposes, it is logical to use as a basis for numerical calculations the main hydro-physical property of the soil (SWRC), which determines the dependence of soil moisture pressure on soil moisture and the function of moisture conductivity (Alekseev et al. 2020).

These most important characteristics of the moisture conductivity are completely dependent on the physical and mechanical properties of the soil (Alekseev et al. 2019c), which makes it possible to most accurately determine the movement of

moisture in the soil. In world practice, there are many different models of moisture retention from soil moisture (for example, such as HYDRUS), but they usually involve the use of a large array of input constants.

The function of moisture conductivity shows how, under the influence of a pressure gradient, moisture with dissolved nutrients will move along the soil. Changing the function also changes the volumes of moisture flowing from one point of space to another. When considering the energy of soil moisture, we take into account only ψ'—the potential due to the interaction of moisture with the solid phase of the soil, ψ''—the potential due to the interaction of moisture with soil air and ψ'''—due to osmotic pressure (Alekseev et al. 2019a). Then, the dependence of the soil moisture potential A on the volumetric humidity w (Soil Water Retention Curve—SWRC) can be recorded as:

$$\psi = \psi' + \psi'' + \psi''' = \frac{A\Omega_0^3}{\rho w^3} + \frac{\Omega_0 \sigma_{ig}}{\rho} \cdot D(w, \Pi_0) + \frac{RT}{\rho}\left(\frac{C}{M^*} + \frac{C^2\rho}{M(\rho^*)^2}\left(\frac{1}{2}\right) - \mu\right), \quad (1)$$

where Ω_0—volume specific surface, w—volumetric humidity, σ_{lg}—surface tension factor (water–air), ρ—water density, M—molar mass of water, ρ^*—fertilizer density, M^*—molar mass of fertilizer, C—fertilizer concentration, R—universal gas constant, T—temperature, μ and A—invariables, $D(w, \Pi_0)$—function taking into account particle size distribution.

Calculations show that in case of change of volumetric humidity values from 0.3 to 0.5, the coefficient of moisture conductivity on average changed from 3 to 8%, and the potential of soil moisture from 2 to 116% (Reyes-Cabrera et al. 2016). To realize the goal of the study, we have developed a software tool that allows you to model the dynamics of soil moisture with the construction of humidification circuits and isolines of nutrient concentration. It uses the Darcy formula, in which the difference in pressure of soil moisture between two neighboring points is calculated using the formula (1), thus taking into account the type of soil, porosity, granulometric composition. The depth distribution of these values and humidity is given as initial conditions.

The uniform grid function used in the algorithm when specifying all three coordinates has n^3 taken into account in calculations on each iteration of nodes (where n is the number of points of one coordinate). Numerical calculations, despite the speed of modern computers, take a significant time with such a number of grid nodes. To calculate the dynamics of moisture distribution in the soil during drip watering, the following algorithm was used: a certain volume of moisture was supplied to predetermined grid nodes (cube with ribs in $\Delta h = 1$ mm) located on the surface at a given interval and speed. The calculation of the volumes of moisture flowing between neighboring nodes in layers came from the Darcy equation. In order to calculate the movement of water between the nearest layers of soil vertically, the gravitational potential $g\Delta h$ was added (Fig. 1).

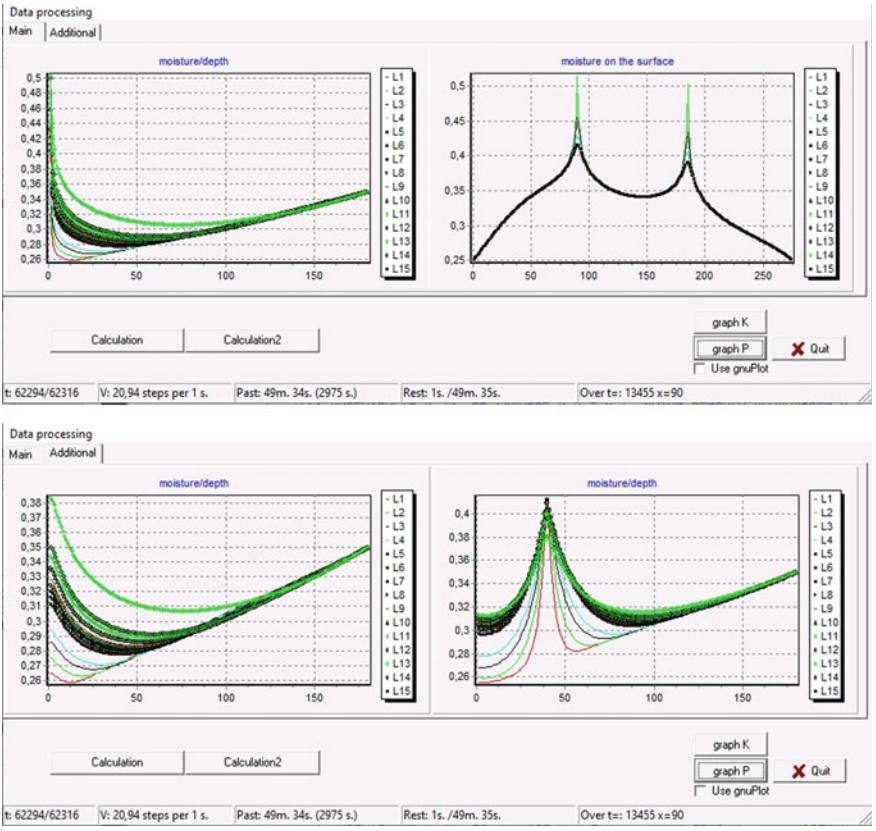

Fig. 1 Demonstration of the numerical automation software. *Source* Compiled by the authors

3 Results

When studying the spatial distribution of the influence of fertilizer during drip watering, the following initial conditions were used in this work. The porosity of the soil practically decreased linearly from 0.60 on the surface to 0.49 at a depth of 0.80 m. The specific surface on the contrary with a depth of significantly increased from 40 m^2/g on the soil surface to 46 m^2/g at a depth of 0.80 m. The calculation was made from the conditions at which 20 l of water was continuously supplied to a given surface point for 80 h. Previous studies on the adequacy of drip irrigation modelling on prone land with clean water have shown a good level of correspondence of the simulation results to experimental data R^2 from 0.64 to 0.78 depending on the slope value (Alekseev et al. 2019b; Byshov and Uspensky 2019). In this case, the processed values of the results of the experiments give lower values R^2 from 0.56 to 0.68. This is due to the fact that not the volumes of water themselves are calculated, but the masses of nutrients carried by them.

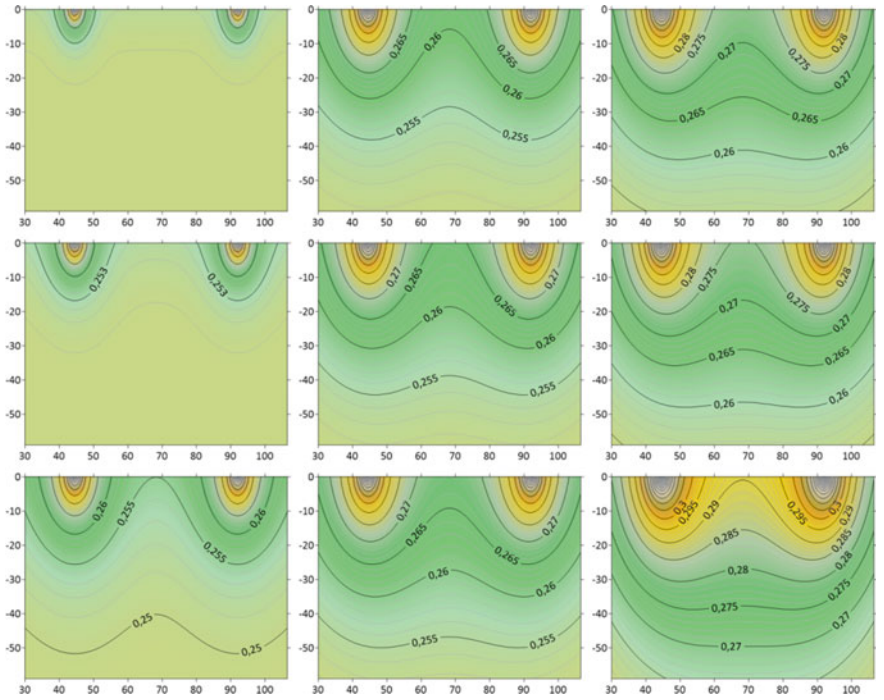

Fig. 2 Simulating the dynamics of humidification contours in homogeneous soil with uniform moisture gradient in depth. *Source* Compiled by the authors

Figures 2 and 3 show that the simulation results show significant differences in the final distribution of fertilizer in the soil. The results of the experiments also confirm that discrepancies occur. The shapes of the circuits affect the formation of the root system and the content of nutrients, which, after completion of watering and drying, are concentrated precisely in the areas of the boundary of the humidification circuit. In the figures, noticeable differences in the contours formed at different initial humidity can be observed. Since drip watering is organized immediately for a number of plants, it is possible to more accurately select the conditions under which the adjacent circuits close. With lower initial humidity, the closure is "slower," that is, more irrigation water will be required to achieve this effect.

4 Conclusion

A software product has been developed in order to calculate soil moisture contours. The theoretically justified approach made it possible to establish patterns of soil humidification and describe the formation of contours at different amounts and rates of water supply, taking into account the initial soil moisture. It allows you to track

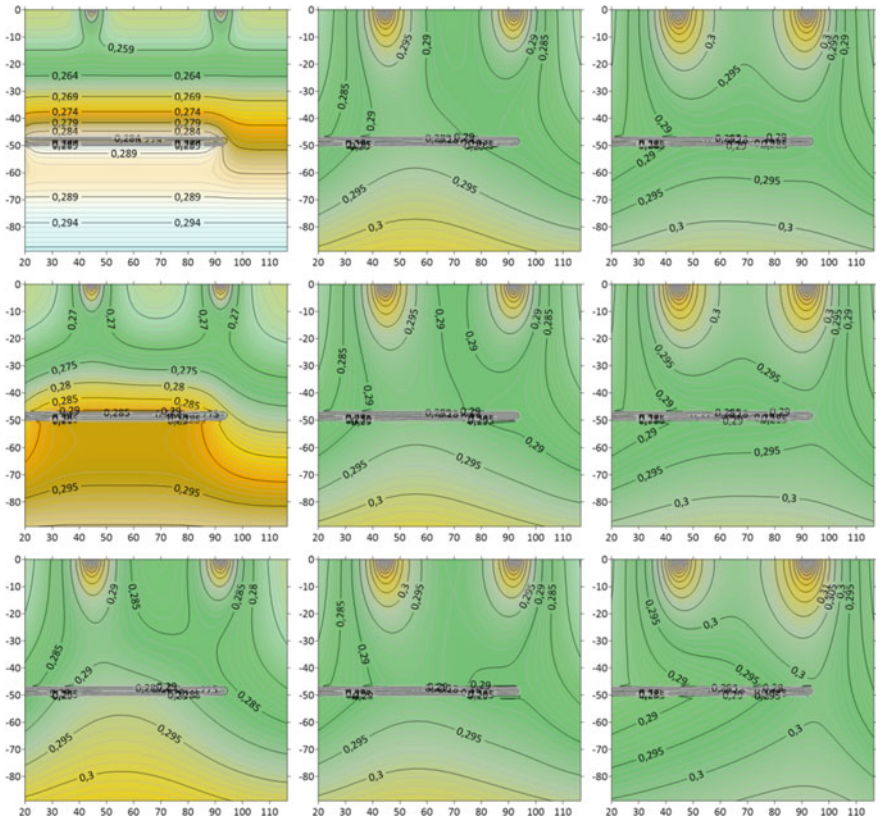

Fig. 3 Dynamics of humidification contours in soil with pronounced heterogeneity. *Source* Compiled by the authors

the dynamics of the parameters of the humidification circuits during watering. As an example, the processes of moisture contours growth on typical soils of the Republic of Tajikistan are considered. It was found that until a certain period of time from the moment of the start of watering, the influence of the slope can be neglected, but in the future they undergo noticeable distortions and runoff on the surface begins. Examples of influence of soil inhomogeneity in the form of clay inclusions on dynamics of humidification circuits are considered. This allows you to optimize the volumes of irrigation water supplied and calculate the periodicity of irrigation.

At this stage of research, in the calculations, we do not take into account the influence of salts on the increase in the potential of soil moisture described by the main hydro-physical characteristic. However, the use of the Vant Goff formula allows this to be done and thus take into account the effect of fertilizers dissolved in irrigation water on changing the geometric parameters of the humidification circuits.

The approach proposed in our international study takes into account the difference between the temperatures of soil and irrigation water, the dependencies of which

on temperature are known, which will significantly increase the effectiveness of reclamation activities in dry climate zones.

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Customer Relationship Management Issues or Service Targeting as a Key Aspect of Company Competitiveness

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Abstract Today, the service is one of the key advantages, and in many areas of business it has become the only competitive advantage. Categorically, the service can be designated as a "Business Client/s" system, where the control regulator is an element of the "Business/Company" subsystem; therefore, the main communication is formed and its character is indicated, which means the Client perceives the effect result. The bond formed is determined by a cycle or "turn" of a spiral of relations having an iterative character. Here, the feedback is the Customer's attitude is most significant and has its own, significant, impact on all "stages" of the Customer's relationship cycle. The Client's assessment is based only on perceived results and the established impression that form his mentality. Analysis and research of the concept of feedback control—Client/s ratio made it possible to identify a number of significant problems of this aspect. The implementation of service targeting functions contributes to the formation of client orientation principles and, as a result, relationship management as part of the ramification of client expectations. In turn, the localization of problems allows you to realize huge potential and reserves, which significantly contribute to the successful conduct of business and, accordingly, competitiveness. The purpose of the article is to designate the service targeting as the basic concept of the service, to reflect its significance in feedback management—the relationship of the client with the company and, accordingly, the company's competitiveness. The work uses open access materials and publications and methods such as monographic, systemic approach and analysis, etc. Service features were noted in the article, the nature of customer relationship management problems was described, the service targeting was considered as a Business/Company gradient, analysis and research made it possible to indicate that service targeting functions contribute to the management of feedback

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and relationships within the framework of the rationalization of client expectations and a long-term competitive advantage.

Keywords Service · Client · Targeting service · Feedback · Customer attitude · Attitude management · Competitiveness

JEL Codes O14 · L83 · Z32

1 Introduction

In modern conditions, "we are no longer fighting for markets—we are fighting for customers" (Pons 2014). "The increasing acceptance of the concept, centered on the client, has and will have far-reaching consequences for business, producing a real revolution in thinking" (Keith 1985).

"Service—in many areas of activity has become the only competitive advantage. The service is a new standard by which customers judge the quality of the product" (Shoole 2017).

As an undeniable fact, we can state that we (Russia) did not have a service system and a business school that implements the service concept, as such, did not have historical experience. But the market does not tolerate "emptiness". "Systems (business) are forced to change their space-time coordinates, characterized by their conditions, requiring new forms and quality of the systems themselves (Panasenko 2018a)". In our case: on a certain turn—the coordinate system Service, today—the coordinate system Service" (Panasenko 2019). Business/Company gradient—targeting service are as the basic service concept (Panasenko 2018a, 2019).

Practice shows that "only the service model adequately and fully reflects the accuracy of the Customer's positioning formed by the main communication; relationship means the Customer's perception of the result of the Company's actions, which affects subsequent actions, that is, two-way communication" (Panasenko 2019). That is, the main connection expresses the relationship with the Clients. At the same time, the key point is the nature of communication formed by the Company. In turn, it is this aspect that determines the quality of the relationship and determines not just the possibility, but the effectiveness of feedback management—the Client/s relationship.

2 Materials and Methods

"Customer Relationship Management is the development of customer relationships and retention." (Krylatov 2018) "However, today customer relationship management has evolved into customer profitability management—a one-way approach that takes into account only economic costs and does not shed light on the reasons why customers choose a company." (Fournier and Avery 2014).

In order to better understand the problem of forming long-term relationships with Clients, it is important to understand the essence of the stages of the customer relationship cycle. The significance of this moment is especially "urgent" in the tourism industry during the tour/trip.

Categorically, as much as possible, the service can be designated as a Business Client/s system. At the same time, the control regulator is located in the Business/Company subsystem. The Company-Client system is dynamic, which is characterized by a cycle—a "spiral" of relations (Panasenko 2018b).

3 Results

Modern industries, including tourism, are accompanied by the development of technologies: Internet; social networks; artificial intelligence; video, infographic; mobility (mobile devices).

A characteristic feature is that the marked cycle is no longer linear, but rather iterative (Gonzalo 2014).

Given the systemic nature, the Customer-Company relationship cycle can be presented as a model of interrelated elements: S—aspiration/inspiration; P- planning; O—comparison/valuation, G—transaction/purchase of product; W—stay; T/D—client/detractor (figure); arrows denote feedback—Customer relationship.

1. Aspiration/Inspiration (S). The first stage of the cycle, decision making, first the product or event is positioned, the destination—the idea is formed in the mental model of the potential Client.

At this stage, sources of inspiration: the closest environmental factor has the greatest influence—parents, friends and colleagues (64%), as well as the Internet plays an important role (64%); magazines/newspapers—44%, TV- 31%, brochures/booklets—22%, books—22, travel agencies—10%, tour operators—7%, radio—6%, 800 or free number—3% (http://www.ipsos.com/en; http://www.thinkwithgoogle.com/intl/ru-ru/industry/travel/).

As a rule, the following are used: video (YouTube, etc.), Instagram, etc., traditional media: TV, radio, outdoor banners, displays, etc.

From the point of view of relations with the client, the problem will mainly be concentrated: around communities in the main social networks. It is necessary to understand here—at this moment the potential Client creates a dream in his mentality and the main task is to "to cast seeds" for a possible decision to visit the destination, taking into account its peculiarities.

Mentality—mental models are the basis of behavior and decisions, characterize principles and values, predefine assessment (O'Connor and McDermott 2006). Taking into account the "nature" of thinking and the significance of mental models, the Company realizes the opportunity to organize with the Client and thereby prevent the phenomenon of fundamental attribution error from being displayed (Panasenko 2018b).

2. Planning (P). At the stage of planning by the client, the web increasingly prevails over traditional sources: The Internet (87%), close environmental factor (48%), magazines/newspapers—28%, books—25%, brochures/booklets—24%, travel agencies—17%, TV—13%, 800 or free number—10%, tour operators—7%, radio—4% (http://www.ipsos.com/en; http://www.thinkwithgoogle.com/intl/ru-ru/industry/travel/).

Although the Internet is in the first place, not all platforms are equivalent. The most important sources of influence are (in descending order) (News and surveys, 2019): sites for comments (TripAdvisor, Yelp, etc.); online agency sites (Booking, Expedia, etc.); supplier sites: airlines, hotels, restaurateurs, etc.; tourist offices.

In addition, it is necessary to take into account many new features available to the client: from mobile applications offering last-minute offers (HotelTonight, Level Travel, Burning Tours, Travelata, etc.), to group shopping websites (Groupon, Mygip, AliExpress, Jetsetter, NeverLand, etc.) and joint sites (AirBnB, HomeAway, Wimdu, etc.).

Therefore, there is a significant choice, which is especially important for the collection of data on potential customers, not to mention reminder initiatives. At the same time, "unprecedented feedback speed, the ability to constantly respond and adapt to the response, an assessment of what can only be approved by the Client" (Panasenko 2018b).

3. Comparison (O). When a potential Customer enters the comparison mode, he has already, as a rule, determined the product, event, direction/s that form the selection potential. The choice depends on the criteria important for the Client: prices, accessibility, comfort, value, prestige symbol, etc. Many of the sources, but it is necessary to take into account the new reality: meta-search sites (Trivago, Hipmunk, even TripAdvisor) now offer prices taken from various sites of online travel agencies (OTA—Online travel agencies).

OTA business. Expedia or Booking aims to get as many institutions as possible to offer ready-made solutions for customers who are becoming hyper-sought after social networks and other online technologies.

4. Transaction/purchase of a product (G). At this point, the key question is, how do I ensure that a prospective customer decides to make a transaction? And also: Is the website transactional? Is the website suitable for mobile traffic—smartphone or digital tablet?

It should be borne in mind that the customer will look for guarantees and insurance during the transaction. For example, the elements that should be expected are clear and noticeable on the site: a guarantee of a better price (avoid contacting the client elsewhere, especially on the OTA); site security, at the level of payment by credit card; ability to chat with a representative of the Company or the Provider, as well as from the destination; social media to answer questions and feedback from past, current and potential customers.

Please note that there is a buffer period between the time of transaction and its execution by the Client. Thanks to well-designed tactics, you can communicate with the Client before his arrival, which, incidentally, determines the attitude to the brand and affects the image of the Company. As an example, a letter sent in advance to

confirm the elements of the transaction, the possibility of upgrading the class or special fees for "exclusive" for Customers, a special offer: booking in a restaurant, spa treatments, etc.

5. Stay (W). The client, arriving at the destination, usually recalls his previous experience. The main part of the relationship is between the receiving party and the Client. The office plays the role of the host in the territory, but often does not have client stories in its database.

Here, the key point is not the "mythical" needs of the average "consumer," but the real expectations of the Client. At the same time, focusing purely on "needs," the problems that arise in the client are leveled. In the digital age, the problem of a new type of Customers is identified, which will send its feedback ("negative") on Twitter or Instagram.

You must be tuned to social media to respond to these requests and comments at any time of the day and regardless of the day of the week. It is important to combine real and virtual, choose SMS alerts in the same way as email, as updates on social networks, not to mention old good leaflets and human contact.

In addition, at this stage of the process, it is necessary to determine the information about the Clients and enter it into the database for subsequent messages. It is this "stage" that imposes a significant "imprint" on the formation of the nature of the feedback, the experience of the Client (see figure).

6. Client / detractor (T/D). As soon as the Client leaves the receiving party and destination, it becomes either a potential Client—an "attractor" (from lat.—Attract) or a detractor depending on the experience acquired; detractors are clients who have received negative experience and readily give negative recommendations.

Here, feedback—the Customer's attitude is most significant and has a significant impact on all "stages" of the Customer's relationship cycle (see Fig. 1). "It is sustainable communication that forms a positive assessment, confidence of the Client, thereby contributing to the strengthening of the Company's image. The Client's assessment is based only on perceived results and the established impression." (Panasenko 2019) It should be noted that the dynamics of the impact of the media, on the one hand—the external (business environment), on the other—the

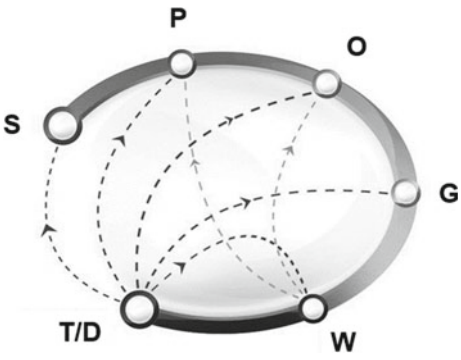

Fig. 1 Customer relationship cycle model. *Source* Gonzalo (2014)

internal (quality of the Company's actions), contributes to the "degeneration" of communication into neutral or unstable.

4 Discussion

Companies (travel agencies) make a call or e-mail a survey questionnaire after a stay to receive feedback from the Client. However, it should be noted that these actions are carried out after the Client has already developed a certain experience, a certain mentality has formed (Sharonov 2016).

Noted in the questionnaire allows to designate "Business/Company gradient: targeting service. The function of service targeting is to create a desire and demand among customers in continuing cooperation with the Company, to preserve existing and attract new Customers. Thus, solving one of the tasks of the service: the formation (maintenance and development) of the client base " (Panasenko 2019).

The research of competencies in the construction, development and management of relations with Clients was carried out in the market of the tourism industry, accommodation, beauty, technical service of cars in the Moscow region, Krasnoyarsk and Krasnodar Territory, and Crimea.

Analysis and research of the concept of service targeting and feedback management—the Client/s ratio allows to note: analytics of the feedback control element—the relationship with the Client, as a rule, functions in isolation from the primary source; subjectivity and absence of the Client's feedback control system/s negatively affect the result—quality of control; formalization of client-orientation sets the task of service targeting; service targeting and feedback management functions—the Client/s ratio largely determines the mentality of employees. The analysis (factor) made it possible to distinguish the relationships and approaches to the realization of customer expectations.

The proposed solutions contributed to the development of the principles of service targeting and, as a result, the management of relationships between interdependent groups of customers and Companies as part of the ramification of client expectations (solving problems) to the types and quality of the service product.

5 Conclusion

The dynamics of relations are essentially determined by the cycle—the "turn" of the spiral of relations, which has an iterative character. Each stage of the cycle generates a mental model of the customer. The Internet, including social networks and mobile applications, has a significant impact, and it is important to combine real and virtual. The key point is not the "mythical" needs of the average "consumer," but the real expectations of the client, which predetermines the potential client or detractor.

The implementation of service targeting functions facilitates the management of relationships between interdependent groups of customers and companies as part of the ramification of client expectations for the type and quality of the service product. Thus, localization of problems in this area allows you to realize huge potential and reserves, which significantly contribute to the successful conduct of business and, accordingly, the competitiveness of the company.

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Russia in the World Tourism Market

Tamara Ya. Silvestrova, Tatiana M. Lebedinceva, Larisa V. Ulybina, Liliya A. Bolshova, and Alla N. Belogorskaya

Abstract The current model of economic development of the world economy has created the conditions for the active development of the services sector, which, according to the World Trade Organization, in recent years has outpaced the sphere of material production in terms of development. WTO statistics show that the share of the services sector in world trade accounts for more than one quarter of all world trade, and in a number of countries in the world the number of jobs in this sector accounts for most of the labor market (for example, in the USA). The high rate of development of the services sector in world trade is mainly due to the significant pace of STP, which expands the services sector, contributing to the emergence of new types of services, improves the level of quality of services, and erases technical barriers associated with the delivery of services. Among all types of world services markets, the most active development today is the tourism services market. The attractiveness of this service sector can be explained by its multiplier effect, the development of this service sector for the countries of the world is a kind of catalyst for the growth of other sectors of the economy.

Keywords International markets · Tourism services · Competitiveness · Revenues · Resources

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JEL Codes F1 · F4

1 Introduction

The role of tourism in the world economy and its impact on the economies of individual countries and regions of the world is difficult to overestimate—this is one of the most actively developing sectors of the world economy in recent decades. International tourism is one of the most important channels of foreign exchange revenue for a large number of countries in the world, and also it has a significant impact on the socio-economic situation in countries, generating jobs and growing incomes of the population (Zaitseva, Tourism Natz. Un-ta. (Ukrainian), p. 51, 2012).

The development of the tourism services sector has a positive impact on GDP growth, optimizes the structure of the country's balance of payments in its part of trade in services, contributing to the creation of a surplus. (Butsenko 2017, p. 101).

In addition, the developed tourism industry ensures the filling of the revenue part of the budget of many countries, which creates a resource for financing other areas of the economy (Fedorchenko 2013).

2 Materials and Methods

The scientific validity and the degree of reliability of the main provisions are confirmed by the use of scientific works of Russian and foreign scientists in the development of the world economic system, its individual segments and industries; a study of the socio-economic characteristics of modern reality; representativeness of the empirical base of the research.

The authors also used materials from Order of the Government of the Russian Federation of May 5, 2018 No. 872-r (Order of the Government of the Russian Federation 2018) in this study.

3 Results

World trade statistics, published annually by WTO, confirm that tourism in the world economy has become one of the most important income articles of a number of countries. At the same time, tourism revenues outstrip revenue in many world commodity markets (the exception are energy and chemical markets). In a number of countries, it is tourism that is the locomotive that contributes to the development of other sectors of the economy.

A billion-dollar turnover of the tourism market can help to increase income generation, receive various social and political dividends for any country in the world if it finds opportunities and conditions for gaining share in this market.

Once every two years, international companies and organizations, government entities that are members of the World Economic Forum (WEF, Davos) form a rating of countries of the world, reflecting their level of competitiveness in the field of tourism. The rating is based on statistical indicators of world countries, tourism organizations and companies and surveys of world business leaders in the tourism sector. This rating integrates 4 evaluation directions, where 14 indicators are included (Table 1).

The TTCI rating is designed to reflect the dynamics of the main criteria for assessing the tourism market in the context of the countries of the world. As of 01.01.2020, there are 197 officially recognized countries in the world, but the TTCI rating for 2019 includes only 140 countries (Kitsis 2020).

Since 2013, the Russian Federation has significantly strengthened position in the ranking, rising from 63 places in 2013 to 39 places in 2019. A significant rise in the rating in 2015 (by 18 points from 63 to 45th place) occurred after the 2014 Winter Olympics held in Sochi, as well as in 2019 (from 43 to 39th place)—after the Mundial—2018 held in Russia, the World Cup was held in 11 cities of the Russian Federation.

Evaluating showed Russia in the TTCI ranking, one can note their heterogeneity—a fairly high level of assessment in relation to natural and cultural resources

Table 1 Competitiveness rating of countries in the tourism industry (TTCI) for the Period 2013–2019

2015		2017		2019	
Country	Index TTCI	Country	Index TTCI	Country	Index TTCI
1. Spain	5.31	1. Spain	5.43	1. Spain	5.4
2. France	5.24	2. France	5.32	2. France	5.4
3. Germany	5.22	3. Germany	5.28	3. Germany	5.4
4. USA	5.12	4. Japan	5.26	4. Japan	5.4
5. Great Britain	5.12	5. Great Britain	5.2	5. USA	5.3
6. Switzerland	4.99	6. USA	5.12	6. Great Britain	5.2
7. Australia	4.98	7. Australia	5.1	7. Australia	5.1
8. Italy	4.98	8. Italy	4.99	8. Italy	5.1
9. Japan	4.94	9. Canada	4.97	9. Canada	5.1
10. Canada	4.92	10. Switzerland	4.99	10. Switzerland	5.0
…	…	–	…	…	…
45. Russia	**4.08**	**43. Russia**	**4.15**	**39. Russia**	**4.3**

Source The Travel & Tourism Competitiveness Report 2019 http://www3.weforum.org/docs/WEF_TTCR_2019.pdf

Bold value significance the Russia's values

(20th place in the ranking) and 106th place out of 140 countries in relation to the organization of tourism policy and favorable conditions.

Experts explain such a low level of subindex B "Tourist policy and favorable conditions" of Russia with a poor level of international openness (due to a fairly strict visa regime), however, from January 1, 2021, the country should begin to reform the visa system, which will allow citizens of 53 countries of the world to apply for a visa to Russia in electronic format, without the need to visit visa centers. Today, the number of states whose citizens have the right of visa-free entry into the territory of the Russian Federation is 30 countries. Since the end of 2019, the Ministry of Foreign Affairs of the Russian Federation began developing a law according to which it will be possible to issue a multiple visa to all foreign citizens, the validity of such a visa should be six months (Table 2).

The Russian Federation received high points in the ranking in terms of indicators characterizing health, natural resources and cultural values (6, 34 and 18 places,

Table 2 Components of the TTCI rating of the Russian Federation (subindexes and indicators) as of 2019

No.	Indicator Name	Rank	TTCI Index
Subindex A. Friendly environment		*48*	*5.3*
1	Business environment	92	4.3
2	Safety and security	98	5.1
3	Health and hygiene	6	6.7
4	Human resources and the labour market	35	5.0
5	Information and communication technologies	48	5.3
Subindex B. Tourism policy and favorable conditions		*106*	*4.2*
6	Prioritizing travel and tourism	86	4.4
7	International openness	123	2.2
8	Price competitiveness	27	5.8
9	Environmental sustainability	82	4.2
Subindex C. Infrastructure		*47*	*4*
10	Air transport infrastructure	23	4.8
11	Ground and port infrastructure	68	3.3
12	Tourism services infrastructure	69	4.1
Subidex D. Natural and cultural resources		*20*	*3.8*
13	Natural resources	34	3.8
14	Cultural resources and business travel	18	3.7

Source The Travel & Tourism Competitiveness Report 2019 http://www3.weforum.org/docs/WEF_TTCR_2019.pdf

Bold value significance the subindexes

respectively). Note that in 2019, according to the criterion "Cultural resources and business trips," the Russian Federation was ahead of all European countries, showed maximum progress. Russia has a worthy place in the ranking according to the criteria of price competitiveness (which is largely due to the devaluation of the Russian currency) and air transport infrastructure.

Russia showed the greatest failure in the ranking according to the criteria of business favorability and environmental sustainability (92 and 82 places, respectively, out of 140 countries included in the rating).

According to experts in the field of tourism, estimates of the TTCI rating can be considered quite objective, but the impact on the rating of the existing negative news background in relation to Russia cannot be ruled out. At the same time, the assessment of countries on the competitiveness index in the tourism industry has some contradictions. For example, the method of constructing a rating in a given rating. So, the assessment of the business climate in this rating has 12 indicators, and the assessment of tourism infrastructure—only four. The four indicators include:

- the number of hotel rooms per hundred inhabitants (which cannot be considered the main indicator in the characteristic of tourist destitution)
- the presence in the country of offices of seven well-known international car rental companies (Hertz, Europcar, Sixt, Avis, Budget, Enterprise, etc.)
- providing residents with ATMs
- the results of a public opinion survey on the quality of tourism infrastructure conducted by the WEF in 2017–2018. At the same time, a sample of the survey is not indicated anywhere.

The question is also raised by the association in the assessment of one group of cultural property and business tourism, which is estimated by only five indicators, one of which is the number of stadiums with a large capacity (above 20 thousand people), but museums, theaters, galleries, etc.

As a result, the picture of Russia rating in terms of priority of the tourism sector is built very ambiguously and even unconvincingly—the Russian Federation is inferior in the ranking to all CIS countries, as well as countries such as Uganda and Rwanda.

The provisions adopted for the implementation of the "Strategy for the Development of Tourism in Russia up to 2035 g." (Decree of the Government of the Russian Federation 2018, 2019), approved by the Government of the Russian Federation, contain a whole system of measures that contribute to the development of the tourism industry of the Russian Federation, the dynamics of the development of this industry in the country is characterized today by the growth of most indicators. In this regard, the results of Russia in the TTCI rating according to the priority of tourism can be considered somewhat underestimated.

It is also worth noting on such a rating criterion as "Safety and Security" and the place allotted to the Russian Federation in it (98th place), despite the fact that in 2018 Russia practically impeccably held the Mundial, nevertheless, it lost in the ranking to countries such as Botswana, Zambia and Bolivia.

Note that Russia in the TTCI ranking has practically no average results, but receives either a high rating or a very low one. However, for Russia, which possesses

unique natural resources, centuries-old culture, distinguished by its identity, its prospects for development in the world tourism market are promising. We can say that the picture of the level of demand for services in this sector in Russia is very attractive, even in comparison with those countries where the tourism sector is the most important area of the economy, for example, with Turkey, whose economy is very sensitive to reducing tourist flow, and tourism is one of the key industries. However, the Russian Federation is currently represented on the tourism market in the world by very modest indicators (Vorontsova 2015, p. 62).

The evaluation of the components of individual elements of the tourism services sector makes it possible to see that the most significant element for the tourism sector of Russia is the possession of significant and different resources of a natural, cultural, climatic and recreational nature:

- the multi-ethnic nature of Russian culture, including the diversity of customs of peoples and nationalities living in the territory of Russia, creates wide opportunities for tour operators to develop tourist routes (dog sledding trips, visits to mountain villages, safari in the desert, etc.);
- diversity of climatic belts in Russia (subtropical, temperate, subarctic and arctic) and unique natural zones and resources;
- use of historical features of the country's development (Stalin era and its sights, Soviet era and its symbols, etc.);
- the organization of educational tourism and excursion tours is facilitated by a multi-religious way in Russia, the presence of a huge number of architectural and historical monuments;
- many potential opportunities in the field of ecological and cultural tourism due to the presence of a large number of inaccessible places (for example, the Putorana plateau, Mountain Altai). (Cataleva 2019, 26) World Travel & Tourism Council (WTTC) in the assessment of the place of Russia in the world market of tourism notes that demand for this type of service in Russia during 2016–2021 will increase approximately by 5.3%, and is at about one level with Germany making a lot of an effort for development of the tourist sector. At this WTTC notes that increase in a share of Russia in the world tourist market will happen due to recreational tourism as other types (beach, business, cultural, etc.) didn't gain still due development here and have no big appeal in the opinion of foreign tourists. Therefore, at necessary stimulation of development of the industry of recreational tourism, use of all available potential opportunities the tourist sphere can become for national economy of one of the most promising. (Lebedintseva and Silvestrova 2019, p. 67).

Realities of the international tourist market demand from Russia concentration today on formation of prerequisites of legal and organizational character and also research of economic resources that the available prospects of integration of the Russian market into the international sector the tourist and recreational services were realized.

Successful experience of Russia in holding world sporting events, such as Olympic Games (2014) and FIFA World Cup (2018) had beneficial influence on reputation of the country, showed possibilities of the Russian side in questions of the organization

and financing of global sports festivals. In the world tourist and recreational market Russia strengthened the positions that was very visually reflected by TTCI rating.

The Russian Federation is estimated WTTC as the country with stable indicators of growth in the sphere of tourism today, she advances such countries as Saudi Arabia, Indonesia and South Korea. Statistics of WTTC for 2019 estimates investments of Russia at the tourism industry of 84 bln. dollars that puts her on the 17th place in rating from 20 countries—leaders in the tourism industry.

Trends in the development of the Russian tourist services market, identified by WTTC on the basis of absolute figures, are also confirmed in other indicators - for example, in the growth of paid tourism services in Russia (Fig. 1) and in the increase in the number of hotels, hostels and other places of accommodation (Fig. 2). The growth of the latter indicator was largely facilitated by the fact that sporting events at the global level were held in Russia.

The Internet resource www.visit-russia.ru provides statistical information on the total inbound tourist flow to the Russian Federation in the size of countries of the

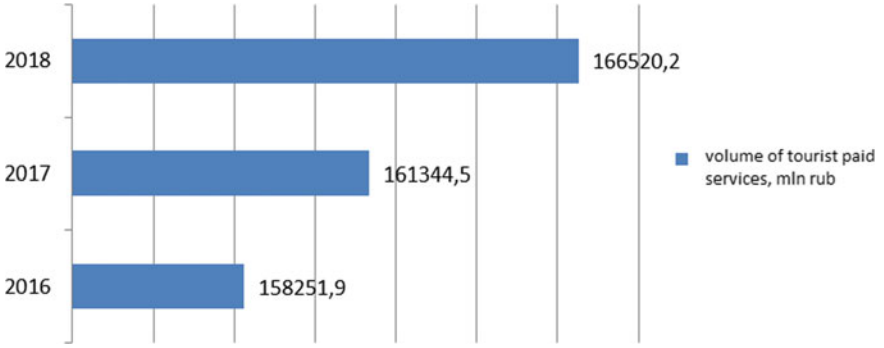

Fig. 1 Total volume of paid tourist services provided to the population of Russia for 2016–2018. *Source* Compiled by the authors

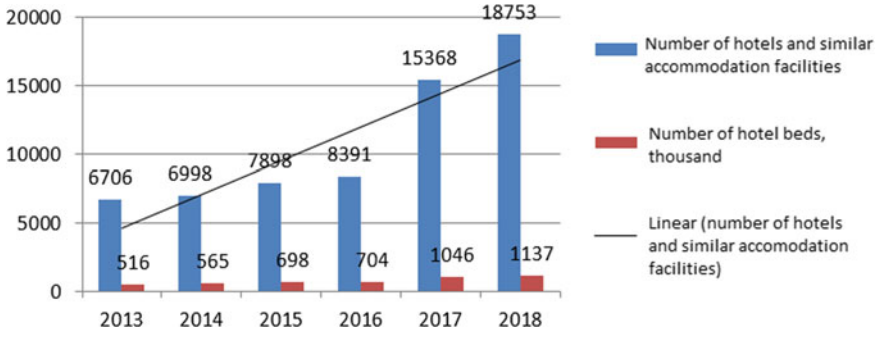

Fig. 2 Hotels and other accommodation facilities in the Russian Federation 2013–2018. *Source* Compiled by the authors

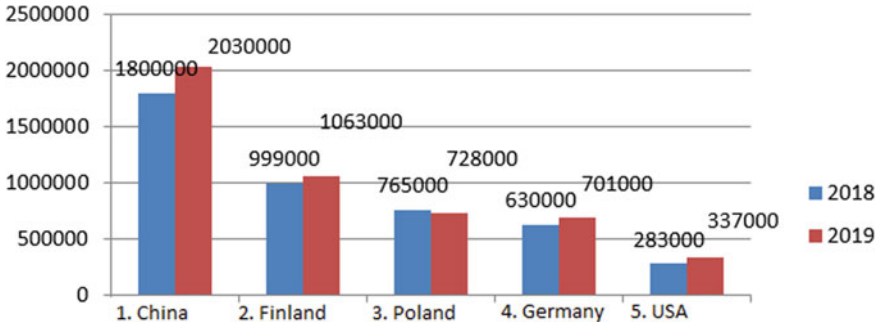

Fig. 3 Top 5 countries of foreign countries leading in the number of tourist arrivals to Russia in 2018–2019, person. *Source* Compiled by the authors

world, while the data are given exclusively for "pure type" tourist trips that do not contain commercial purposes (Fig. 3).

The leaders of the countries whose residents showed the largest number of tourist arrivals in Russia are China (1st place), the USA, Finland, Germany and Poland. Almost all countries from the top 5 showed an increase in tourist arrivals in 2019 relative to the previous period (except Poland), while according to the leader of the rating—China, an absolute increase in tourist arrivals is observed in the amount of 230 thousand, and the United States is the leader in this rating in terms of the growth rate of tourist arrivals relative to other countries (+19.1% compared to the previous year). It should be noted that the fact of the devaluation of the Russian currency almost twice relative to the main world currencies (dollar and euro) in 2015 also contributed to the growth of Russia attractiveness in choosing destinations for travel by foreign tourists.

In addition to statistics on tourist arrivals, the Internet—a resource www.visit-russia.ru makes it possible to track the most popular areas of tourism among foreign citizens coming to Russia. Traditionally, these are the cities of Moscow and St. Petersburg, which are the capitals of Russia - the official and "northern," the route to the ancient cities of Russia (Golden Ring), Irkutsk (due to the proximity of Lake Baikal) and the city of the Far East (Kamchatka). Over the past few years, the flow of foreign tourists in the direction of Gorny Altai has been steadily growing. The top three countries to visit the last region included: Kazakhstan, Germany and China.

4 Conclusion

The assessment of the general state and level of development of the Russian Federation in the world tourism market through international ratings and assessments indicates the presence of unrealized potential, the use of which can in the future bring

significant dividends to both the country's economy and potential foreign tourists. (Lebedintseva and Lisitsyna 2015, p. 81).

The use of Russian opportunities to attract foreign tourists and increase the presence in the world market of recreational tourism can be facilitated by measures related to:

- participation of Russian companies by the tourism industry, representative offices of the Federal Agency for Tourism of the Russian Federation at international conferences, exhibitions, formation of Internet sites; advertising companies in Europe, Asia, the Americas;
- optimization of the infrastructure component of the tourism sector;
- improving the professional level of the personnel component, as well as the degree of reliability and security in general;
- concentration on the development of those tourist destinations that are most in demand among foreign tourists, for example, environmental tourism, cognitive tourism.

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Peculiarities of Consolidated Project Engineering Management for Technological Development of the Meso-Level Entity

Garry M. Alexanyan, Alexander V. Bandurin, and Vladimir V. Bandurin

Abstract The purpose of the work is to specify the features of project engineering management in modern conditions. Table and graphic methods, structuring method, compositions and decompositions, analysis and synthesis were used to carry out the study. The properties of engineering project as a control object are considered. An adapted technological development trajectory is presented, taking into account the cloud approach, the space of opportunities, the environment of combining the interests of different groups of stakeholders. It is shown that the process of technological development has a non-linear and fuzzy character. The engineering project is presented as a chain of nonlinear fuzzy events. The possibility of using the chain to model resource needs in the implementation of several projects, as well as in situations where the project affects various economic entities that make up the meso-level of the economy, has been proved. The main events and stages of the engineering project scenario are considered, including a special stage of the idea development. The problem-oriented approach to development of engineering project scenario is described. The main problems of project engineering in the Russian economy have been identified. It has been shown that one of the sources of problems is the insufficient level of use of artificial intelligence and other modern technologies. A knowledge transfer mechanism has been developed and a possible scheme of elements of such a mechanism has been built in a hierarchical form, which is a system of interference of engineering projects. The classification of elements on the meso level is given. It is proposed to distinguish clusters of promising products using a problem-oriented approach that considers the key challenges of the marine economy in relation to production cooperation at the meso-level. A scheme has been formed for structuring and storing typical engineering projects at the meso-economic level. It was

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concluded that the consolidation of project engineering management at the meso level allows creating prerequisites for improving the quality of interaction between the parties in each project.

Keywords Engineering project · Meso economy level · Fuzzy logic · Project approach · Project engineering · Project management · Project scenario · Project interference

JEL Code O11 · O22 · F63

1 Introduction

In modern conditions, meso-level entities have a large number of opportunities to intensify technological development, including through the implementation of design engineering aimed at reducing the negative impact of existing external and internal problems. Increasing the activity of the parties in the technology market leads to an increase in the interactivity of innovation. That is, the engineering project is the result not only of a comprehensive analysis of the problems of technological development, but also of the way to satisfy the customer's wishes (Bashlakova 2018).

This format changes the logic of technological development, when instead of the vector approach of creating new technological conditions of production, which is described in the Methodology for determining readiness levels… as: "basic research—applied research—development—experimental production—mass production" (Ministry of Education and Science of the Russian Federation 2017), a cloud approach begins to form, in which the technological environment creates a space of opportunities from which you can choose a particular trajectory of technological development. As a result of the selection, the adopted trajectory is fixed in the form of an engineering project implemented in the interests of the customer.

2 Results

A nonlinear and fuzzy process of technological development occurs while modeling. Moreover, nonlinearity lies in the variability of the project stages, and fuzziness is determined by assessing the need for special measures to create specific innovations in the process of setting up the project for the interests of the customer. Thus, an engineering project (EP) can be represented as a chain of non-linear fuzzy events:

$$EP = \{s_i;\ p(s_i);\ q(s_i)\ |i \text{ belongs to } 1, \ldots, S\} \tag{1}$$

where

s_i event, which is the i part (i stage) of the engineering project;

$p(s_i)$ the degree to which the s_i event belongs to the engineering project scenario (feasibility of including the event in the scenario);
$q(s_i)$ the degree to which the s_i event belongs to the project (need to include the event in the project);
S the total number of events available for the engineering project.

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Obviously, for events whose inclusion is not feasible in the script, the parameter $p(s_i)$ will be 0. Accordingly, depending on the progress of the project, various additional events may be required, for which the value of the parameter $q(s_i)$ will be greater than 0. This model allows you to model resource needs in the implementation of several projects, as well as in situations where the project affects various business entities that make up the meso-level of the economy.

In modern conditions, the most common scenario for project engineering is the EPCM scenario (Markov and Loginov 2018), which includes engineering (E), procurement (P), construction (C), management (M). The main stages of this scenario are shown in Fig. 1.

For example, when supplying equipment manufactured in Russia, the event "customs clearance of equipment" is not required, so the feasibility of including it in the

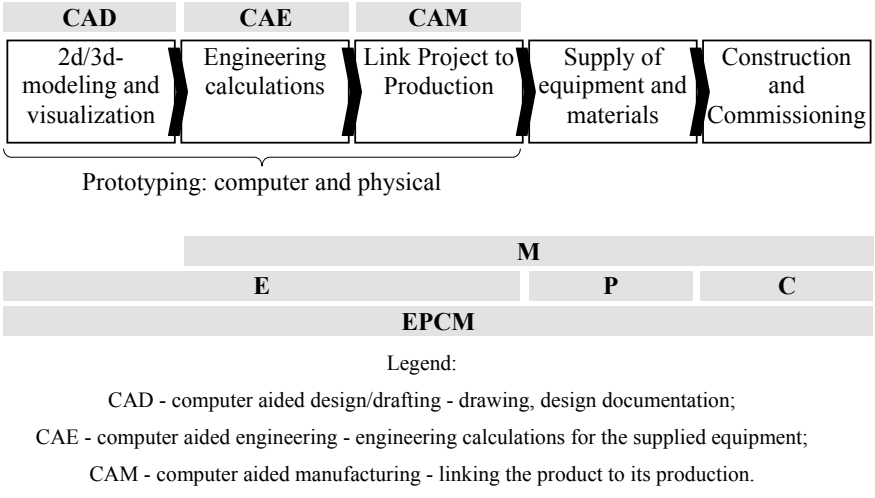

Fig. 1 Main events and stages of engineering project scenario. *Source* Adapted by author (http://minpromtorg.gov.ru/common/upload/docVersions/5a89697b1c9fc/actual/1352.PDF)

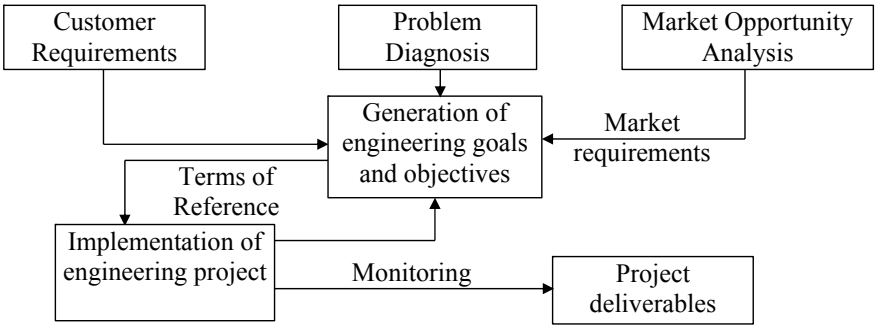

Fig. 2 Problem-oriented approach to engineering project scenario development. *Source* Developed by the authors

project will be equal to 0. Accordingly, the number and intensity of joint management (M) activities will be further analyzed. Depending on the needs of a particular participant of the meso-level subject (for example, enterprise, university), the participation of external specialists in the management process will vary. That is why the $q(s_i)$ parameter will be configured for specific project conditions.

Considering the events of the initial phase of the project in the field of engineering, it is advisable to highlight a special stage of development of the idea (Leuta and Erygin 2018). Then the set of events of this stage can be represented by the following types of works (Fig. 2):

- formation of the purpose and objectives of design engineering at the meso-level;
- diagnosis of economic problems of the participants of the meso-level subject, the solution of which is impossible without the implementation of an engineering project;
- analysis of the technological opportunities of the market and development of the engineering project scenario;
- assessment of the possibilities of project engineering to solve the problem of innovative development at the meso-level;
- prediction of changes in technological development of participants of the meso-level subject.

Taking into account the considered approach, consolidated management of project engineering is required in those entities of the meso-level that have a technological economy. According to Paley T.F., "a technological economy can be considered to use its own cognitive potential to generate a continuous flow of new knowledge that reflects the rapidly changing requirements of the external environment and creates new economic needs" (Paley 2011). Such an economy is able to create not only material innovations, but also new intangible assets, the implementation of which requires project engineering.

It is important to take into account here that the current state of the system of consolidated management of project engineering as a whole can be described

as administrative-oriented (Anisimova 2011). As a rule, most initiatives for the implementation of engineering projects come from federal and regional authorities. Therefore, it is necessary to adapt the existing mechanisms of project engineering management to the peculiarities of the meso-level (Manshilin 2019).

This situation leads to the fact that project engineering in the national economy is characterized by a simulation character, when in the process of developing and implementing specific projects new solutions are not created, but already implemented foreign or domestic projects are duplicated (Korolev and Chernyakhovskaya 2018). One of the main reasons for this situation is the insufficient level of use of artificial intelligence at the meso-level (Carlson 2020). This reason is largely due to the absence of specialized, for example, self-regulatory structures that could unite all stakeholders in project engineering, systematize and form a consolidated request for an engineering project (Yip et al. 2019).

In the current situation, it can be noted that the excessive administrative impact on the sphere of project engineering limits the pace of innovative development of the national economy (Sharonina and Stash 2018). An analysis of objective data shows that a high level of administrative impact slows down the diffusion of innovation, as well as makes it difficult to implement engineering projects at the meso-level (Fig. 3).

In the Fig. 3, the level of administrative influence on the innovation sphere is understood as the proportion of investments in innovation carried out from budgets of various levels in the total volume of investments in innovation at the economic scale. As an innovative activity at the meso-level, the average rate of renewal of fixed assets by sectors of the economy is considered. Accordingly, patent activity is understood as the share of patents registered by industrial enterprises in the total number of patents by type of economic activity in the economy (Klimenko 2019).

The calculation of the values of these parameters was based on a synthesis of information about the economies of the countries concerned. On the one hand, it can be concluded from Fig. 3 that a decrease in administrative impact automatically leads to an increase in innovative and patent activity at the meso-level. But, on the other hand, it is important to note here that the low administrative impact itself is a consequence of the high activity of the participants of the meso-level subject (Andreev and Galimova 2013).

That is, in order to increase the innovative activity of economic entities and develop project engineering at the meso level, it is important to create prerequisites for reducing state participation in innovation activities (Mayevsky 2018). In our opinion, not only administrative, but also organizational efforts may be required here, including in the field of interaction between various participants in project engineering. In any case, the task of increasing innovation and patent activity at the meso-level is the result of a coordinated interaction of all interested parties.

Taking into account the real conditions in the field of project engineering, the objective need of the participants of the meso-level subject is formed to form an adequate mechanism for coordinating the sustainable development of project engineering, including at the level of a single information space. For example, as Karlinsky V. L. and Matantseva M. O. point out, “in the information economy, in order to coordinate innovation and engineering activities and reduce administrative impact

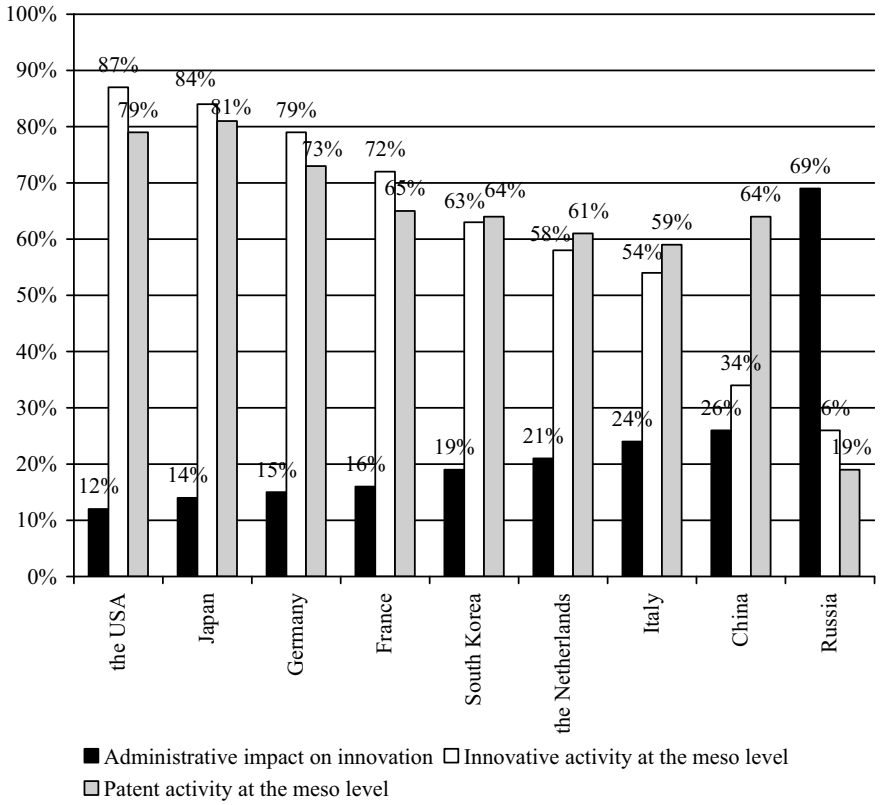

Fig. 3 Parameters of innovation and patent activity in countries in comparison with the level of administrative impact on the innovation sphere. *Source* Generalized by the authors

on the economy, it is necessary to introduce a single platform of high-tech projects, for example, in the conditional format of the" universal knowledge exchange, "integrating directly researchers interested in promoting intellectual developments, and potential customers of innovations in the person of the subjects of the Federation, industries, corporations" (Karlinsky and Matantseva 2017).

A possible scheme of elements of such a mechanism in a hierarchical form is shown in Fig. 4. In fact, this scheme is a system of interference of engineering projects.

3 Discussion

When preparing an engineering project, one cannot ignore possible indirect effects: economic, scientific and technical, resource, social and environmental. On the one

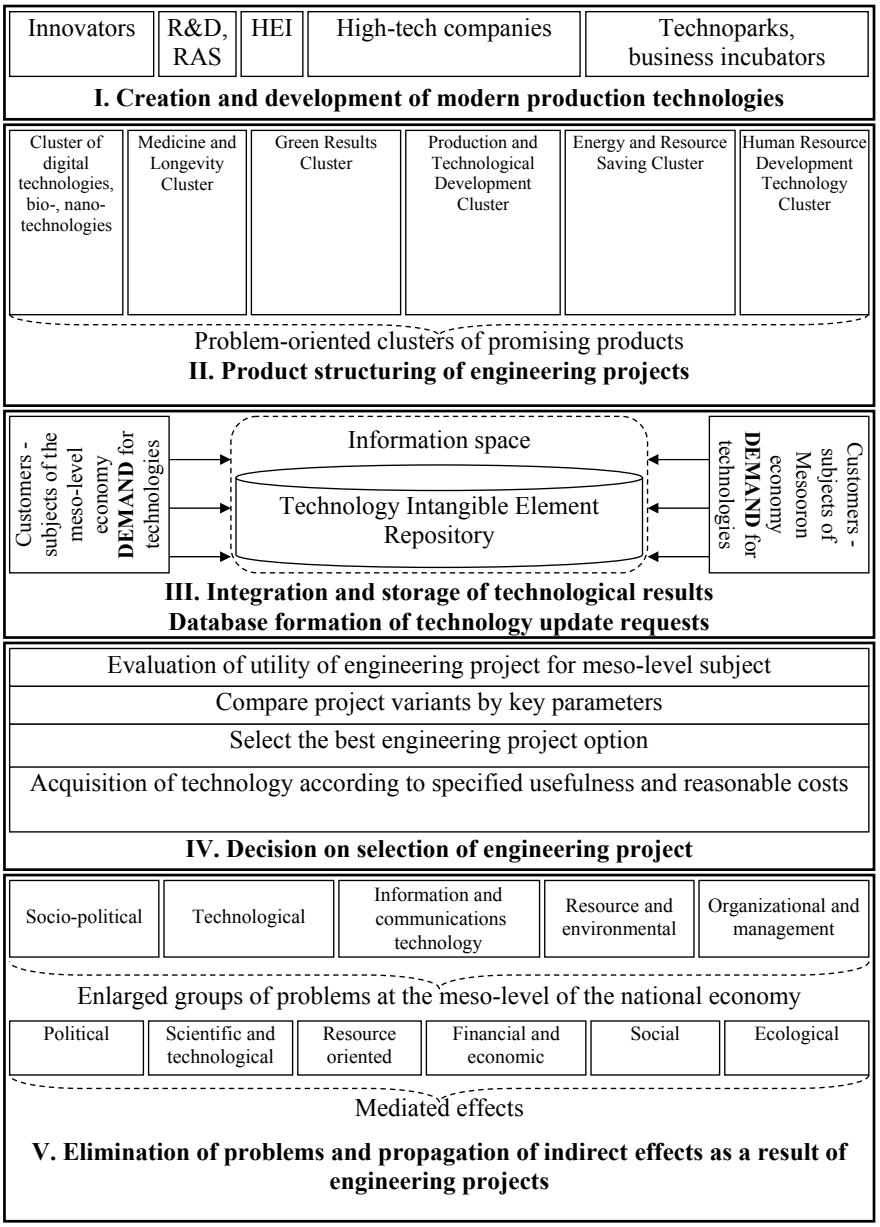

Fig. 4 Engineering project interference system. *Source* Developed by the authors

hand, if similar effects are identified, they should be included in the description of typical projects. This opportunity is also provided by the storage of intangible elements of technologies, since it contains all the information about the available proposals in the field of project engineering (Prokhorova et al. 2018).

However, there may be situations of silencing or hiding effects. This is due, firstly, to the fact that participants in the engineering project may simply not reveal a similar effect; secondly, the nature of the effect itself can be not only positive, but also negative, which affects the effectiveness of the engineering project as a whole. In this context, a repository of intangible elements of technology can also act as an insurance knowledge bank, which contains a special section of customer feedback on the results of implemented engineering projects.

4 Conclusion

Therefore, the mechanism of consolidated management of project engineering in the process of technological development of the meso-level subject is actually a private version of the interpretation of the exchange mechanism with a predetermined set of exchange products, a relatively limited number of participants, as well as a previously known set of effects. At the same time, consolidation takes place in several areas:

1. consolidation of potential participants to the specific side of the engineering project (customer, engineering operator, contractor, innovation generator, etc.);
2. consolidation of information on conditions, resources and results of a typical engineering project;
3. consolidation of resources for the implementation of the project, insurance protection of the parties and ensuring the specified quality of design works;
4. consolidation of technological, technical, economic, social and environmental requirements for the project, which allows to best take into account the conditions and peculiarities of the economic activity of a particular entity of the meso-level.

Summarizing the provisions discussed, we can conclude that the consolidation of project engineering management at the meso-level allows us to create prerequisites for improving the quality of interaction between the parties in each project. This approach ultimately improves the quality of project engineering, but it is necessary to develop special quality indicators that allow you to objectively assess the degree of satisfaction of the parties with the progress and results of engineering projects.

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The Model of Communicative Competence Formation and Development of Financial Specialists

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Abstract The article explores the essential characteristics of communicative competence of financial specialists currently required by employers, the main types of professional activity and occupational standards for financial workers. The authorial model of communicative competence formation and development is presented in the article. The idea of continuing professional education, competence-oriented approach, theoretical provisions of corporate training aimed at communicative competence formation of financial specialists provide the methodological basis of the present study. The theoretical significance of the study lies in the refined definition of the notion "communicative competence of financial specialists". The elicited structure of communicative competence of bank specialists enabled us to substantiate its formation model in a form of a pedagogical construct developed on the basis of authorial principles. Updating of communicative competence specifying the learning content of specialist training makes the novelty of this structure. The implementation mechanism of selected learning content was constructed by means of adding the Corporate-oriented module presented by the authorial course "Communicative competences of a bank employee" to the Basic and Professionally-applied ones. Updating of communicative competence structure characterized from the standpoint of key competences determines the quality of professional training for banking specialists, since it ensures the effectiveness of their performance which envisages the communicative mobility. The proposed theoretical construct, characteristics of its structural components, examples of practical realization can serve as a ground for quantitative educational innovations which stimulate an increase in banking system efficiency.

Keywords Communicative competence · Key competences · Banking specialists · Formation model · Authorial course

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JEL Codes G20 · G39 · I21 · J24 · L14 · M14

1 Introduction

Communicative competence, being a professionally significant quality, identifies the effectiveness of both independent specialists and an organization as a whole. The basic regulatory document of professional training in "Economics" in Russia is the Federal State Educational Standards of Higher Education (Standards and of Higher Education 2001). The key competences to be formed can be divided into three key groups:

- key competences necessary for labour and mobile conduct in the labour market (KC-1 System and critical thinking; KC-2 Project management; KC-3 Teamwork and leadership; KC-4 Communication; KC-5 Intercultural interaction);
- key life-supporting competences (KC-6, KC-7 Self-management and self-development (including health-saving);
- key life- on -Earth -sustaining competences – nooshperic competences (KC-8 Life Safety).

According to the classification, we may see that the competences ensuring communicative types of activity are embedded into the group of key competences.

Having analyzed the occupational standards for financial specialists, we have highlighted three types of activity implementation of which requires communicative competence formation (Fig. 1).

Besides educational and occupational standards the local regulatory documents of the organization specifying the required competences can be applied. In-house educational documents are designed on the basis of company development strategy. Thus, the representative of a leading bank on the arena of banking services—Public joint stock company "Sberbank" Kudryashova (2020) proposed the following requirements to the communicative competence formation of a bank employee taking into consideration the transition to digital economy and domination of "soft" skills over the "hard" ones, among them: customer centricity, problem solving

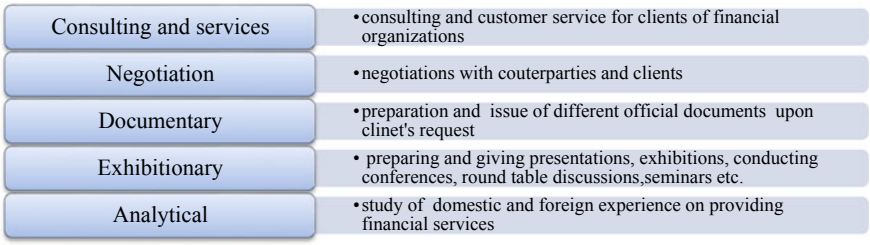

Fig. 1 Types of activity for financial workers. *Source* Compiled by the authors

and system thinking, solution management, innovation, teamwork and cooperation, self-management (Kudryashova 2020).

However, the researchers Hatlamadzhiyan (2012) Tokareva and Dotsenko (2018) point out a low level of communicative competence of banking specialists which hinders achieving a high level of professional excellence. Thus, the implementation of the Federal State Educational Standards of a new generation is not able to overcome the lacks of language knowledge and skills in particular areas to provide training of qualified financial specialists who meet the requirements of occupational standards and particular employers. This necessitates the development of communicative competence formation model which corresponds to the relevant types of financial workers' activity required by employers.

2 Materials and Method

Methodological grounds for the proposed communicative competence formation and development model of financial specialists are based on the following ideas: continuous professional education (Novikov 2000); general development of communicative competence (Khutorsky 2002) and others; corporate training (Kaganov 2013; Klarin 2016); communicative competence development within foreign language training (Safonova 2004; Sturikova 2015) and others; the formation of communicative competence of financial specialists (Klimenko 2004; Usvyat 2008; Dekkusheva 2016) and others.

Based on the analysis of recent theoretical researches on communicative competence formation and specific features of financial specialists' professional activity, the authors of the present research have proposed the refined definition of the notion "communicative competence of financial specialists" which is conceived as a set of interrelated knowledge and skills in consulting and services, negotiation, documentary, exhibitionary and analytical activities encompassing linguistic, normative, socio-cultural and corporate components. Sustainable motivation to professional training and professional activity in financial sector formed within the proposed model is an essential condition for communicative competence development of financial specialists.

3 Results

The proposed model (Fig. 2) consists of the objective, content, procedural and resultative blocks.

The objective of the model is communicative competence formation of banking specialists within the continuous professional training framework which stimulates a rise of banking system efficiency. The objective achievement is based on number of approaches.

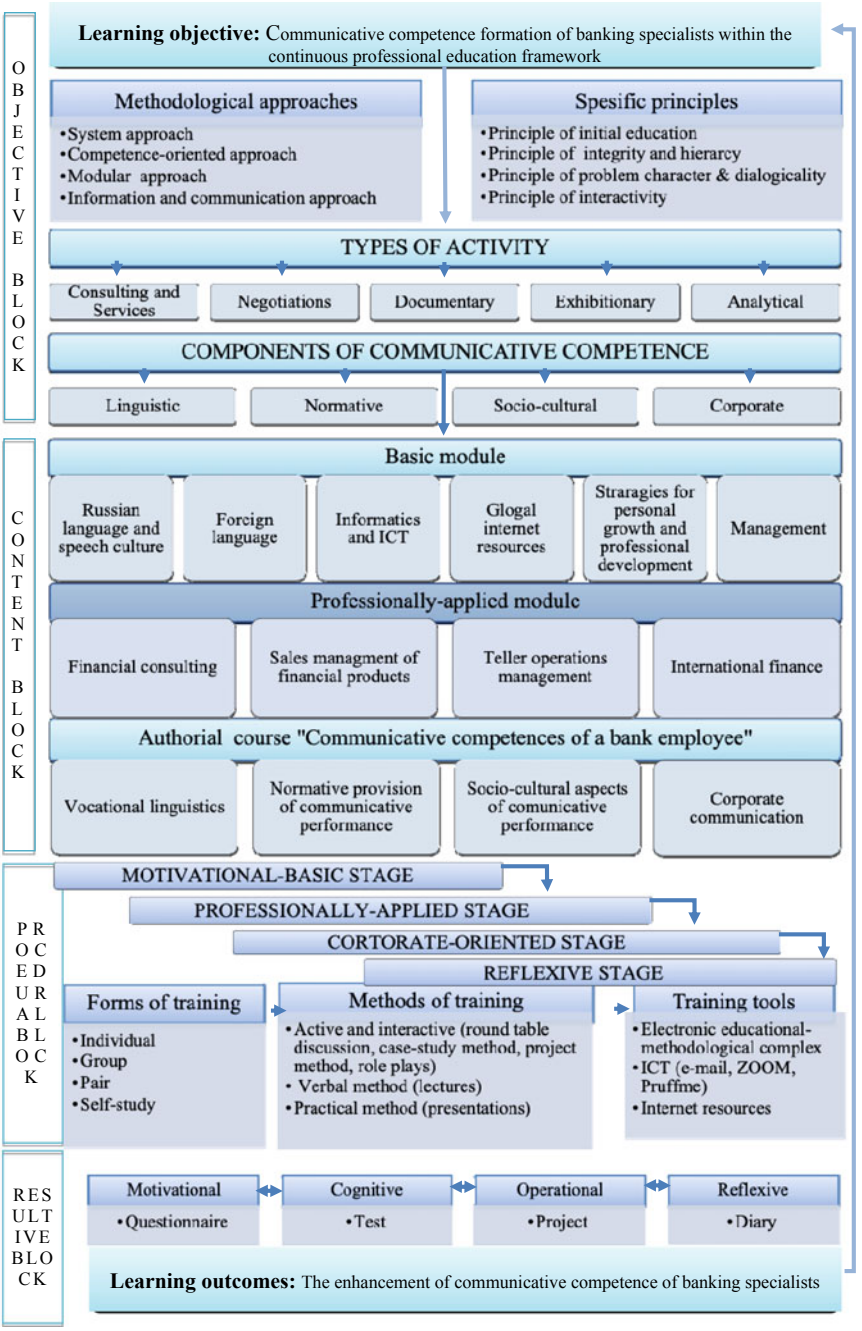

Fig. 2 The model of communicative competence formation and development of financial specialists. *Source* Compiled by the authors

System approach enables to construct structural and functional models which simulate the objects and processes in question as an integral system as well as facilitates the establishment of integral and interconnected structure for the development of communicative competence.

Competence-oriented approach reflects the primary requirements for the system of professional training and provides learners with both the ability of task solving and the readiness for the occupational role in financial sector.

Modular approach refers to the sequential learning of modules—logically complete units.

Information and communication approach allows employing information and communication technologies in educational process aimed at reaching the objectives of training.

The implementation of the above-mentioned approaches involves the exploitation of didactic principles as well as a number of specific principles demonstrating the specific features of the present study (Fig. 3). The suggested combination of approaches and principles for their implementation underlie the theoretical and methodological basis of the study (Tolsteneva and Galkina 2014).

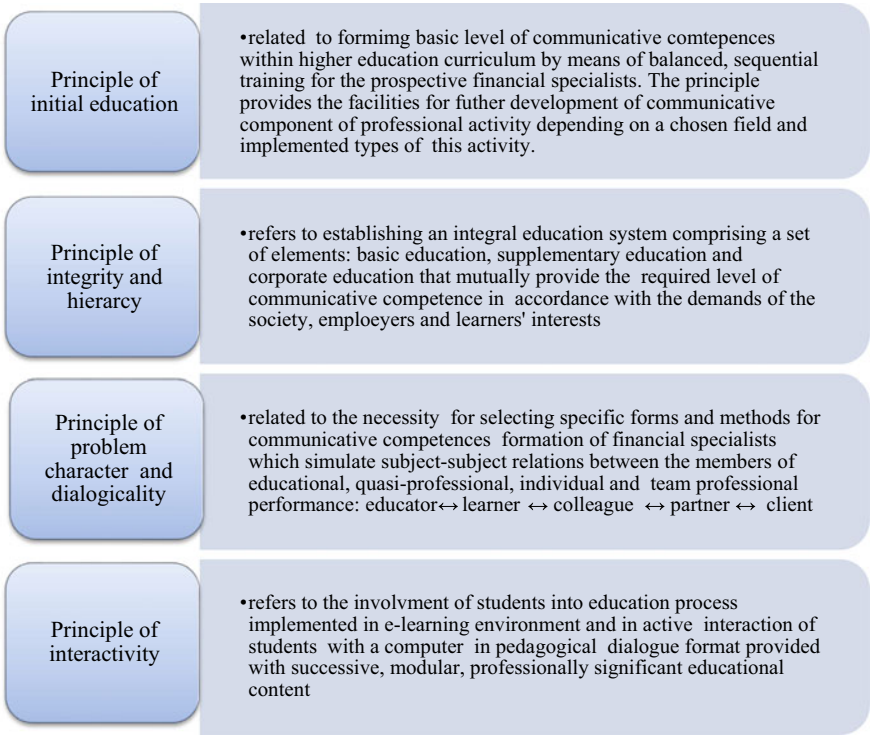

Fig. 3 Principles providing implementation of pedagogical approaches. *Source* Compiled by the authors

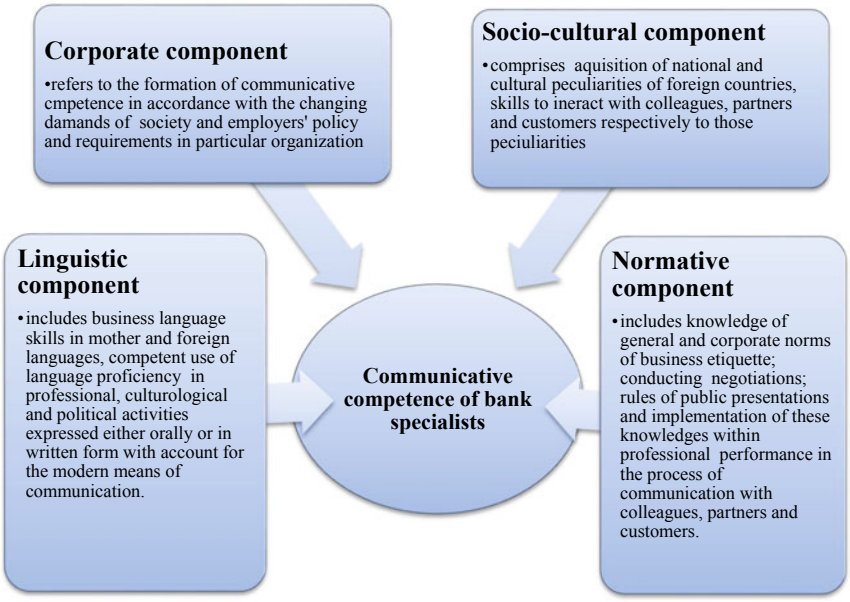

Fig. 4 Communicative competence structure. *Source* Compiled by the authors

The analysis of banking specialists' professional activity allowed to define the components of communicative competence (Fig. 4).

The content component of the model includes the block of disciplines implemented at different professional training stages of prospective specialists in professional area (Motivational-basic and Professionally-applied).

The performed analysis of the learning content of disciplines has revealed some of lacks which hinder communicative competences formation in accordance with the present-day requirements for bank employees. This necessitated the introduction of additional training stage named a Corporate-oriented one. To implement this stage the authors has introduced the course "Communicative competences of a bank employee" comprising number of units.

"Vocational linguistics" unit contributes the formation of the linguistic component of communicative competences. The content of the unit aims at in-depth learning of business and financial vocabulary in foreign language, official and unofficial correspondence in mother and foreign languages as well as paperwork management.

"Normative provision of communicative performance" unit promotes the formation of communicative competence normative component in applying the regulations for giving presentations and negotiations fundamentals.

"Socio-cultural aspects of communicative performance" unit aims at formation of socio-cultural component and covers the issues related to the peculiarities of business communication between representatives with different cultural backgrounds as well as self-management and emotional intelligence.

"Corporate communication" unit deals with issues of corporate culture, ethics and organization of client-oriented service in a bank.

The stage of retrospective reflexion based on the result of the proposed authorial course activates students' cognitive activity through their personal attitude towards the learning material and design their future activity. The reflexive diary is employed as a tool for reflexion implementation.

The procedural component of the model is represented by the elaborated stages of communicative competence formation (Tolsteneva and Galkina 2013a, b) and focused on forms, methods and tools for learning content implementation. Particular attention is paid to the following key methods used during the authorial course training:

- training method applied for the formation of the linguistic component of communicative competencies;
- role play method applied for the formation of the normative component;
- training and case-study methods applied for the formation of socio-cultural and corporate components.

Figure 5 demonstrates some examples of developed case-study assignments.

An integrative method that combines the components of communicative competencies is a project method which includes the individual or group project drafting simulating the presentation, promotion and sales of bank products (leasing, consumer lending, precious metals and derivatives, mortgage lending, campus projects for organizations, etc.) for various categories of clients, including interbank and intracorporate interaction (Tolsteneva and Galkina 2014).

The result component encompasses a criterion-evaluation apparatus that enables to assess the outcomes of educational and quasi-professional activities of students, in

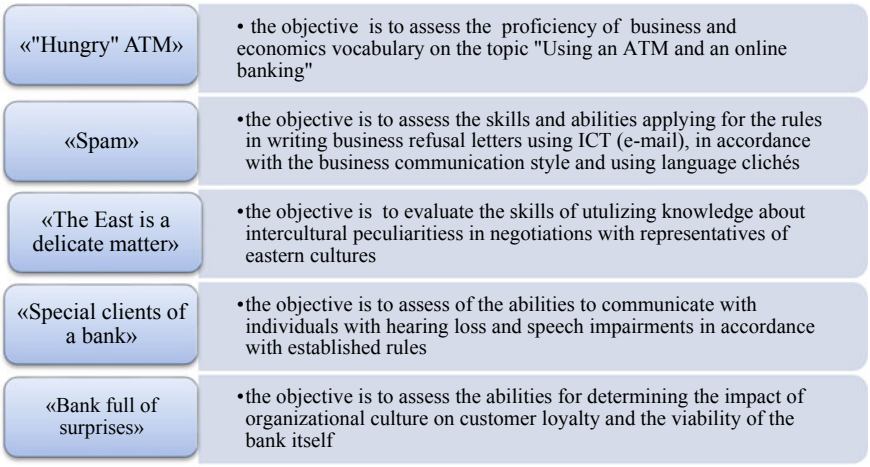

Fig. 5 Case-study examples from the course "Communicative competences of a bank employee". *Source* Compiled by the authors

particular, performance of test tasks, case-studies, preparation and giving presentations; effectiveness of participation in role plays and the quality of completed project assignments.

4 Conclusion

Therefore, we understand communicative competence as a pedagogical category defining the professional training quality of financial specialists from the standpoint of key competences, since it ensures the effectiveness of their performance which envisages the communicative mobility. Employers' survey and the strategy of continuous professional training have detected high demand for communicative competence formation by using more effective teaching and learning tools.

The elaborated structure of communicative competence of banking specialists allowed to substantiate its formation model which has been presented as a pedagogical construct developed on the basis of authorial principles. Updating of communicative competence which specifies the learning content of specialist training makes the novelty of this structure. The implementation mechanism of selected learning content was constructed by means of adding the Corporate-oriented module presented by the authorial course "Communicative competences of a bank employee" to the Basic and Professionally-applied ones. The proposed materials may underlie the quantitative educational innovations stimulating an increase in banking system efficiency.

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The Paradigm of Economic Development of the Enterprise Based on the Mechanism of Capital Formation and Distribution

Elena V. Romanovskaya, Elena P. Kozlova, Natalia S. Andryashina, Ekaterina P. Garina, and Zhanna V. Smirnova

Abstract The purpose of research—to determine the optimal capital structure of the company, in order to develop a set of measures aimed at optimizing the activities of formation and distribution of the company's capital. In the course of the research, methods of economic analysis were used, namely statistical, balance, structural, grouping, and comparison. Methods of statistical, financial analysis and expert data analysis were used for the calculations. In the current conditions of a market economy, the question of how to form capital rationally with maximum returns, how to distribute it, and in what conditions it will function, is especially relevant. With the help of the expert assessment method, optimum sources of raising funds have been identified. The most effective method of financing is capitalization because in this variant there are fewer risks and ease of operation. For the implementation of capitalization recommended to convert funds in additional capital, and additional factors of production, thereby achieving an increase in the size of its own funds. Authors proved that in modern conditions of market economy the optimal formation of capital is the factor that has a direct influence on financial condition, long-term solvency, income, profitability, and these are the defining concepts of successful companies.

Keywords Development · Enterprise paradigm · Technology · Capital

JEL Codes M20 · M21

1 Introduction

Formation of enterprise capital is a process that needs constant control and evaluation of optimal ratios of own and borrowed funds. Only with a detailed calculation of

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the capital structure for those who have assets will get maximum benefit without significant risks to the financial strength of the enterprise.

At the moment, there are no certain requirements for calculating the optimal ratio of the two components of capital. Assessment of each individual capital of the organization is based on an individual approach, which is based on industry characteristics, attributes that characterize the production process, and stage of development of the enterprise (Kuznetsova et al. 2017; Potashnik et al. 2020).

A set of measures for enterprise asset management allows not only to ensure financial stability in the short and long term, but also to carry out the structuring of financial sources according to their importance and value (Andryashina et al. 2020). The consequence is that the enterprise is able to build relations to attract equity capital with shareholders, and if it is necessary to obtain borrowed funds, the company cooperates with creditors while taking into account the priority of a particular type. Enterprise search policy leads optimal capital structure which includes a list of the ratio of their own capital and contingent that maintains the level of financial stability and high solvency (Kuznetsov et al. 2018; Sedykh 2019).

At the moment the business is represented by enterprises with different forms of ownership, so for modern entrepreneurs the question of how rationally and with maximum return to form the capital, under what conditions it will operate, and what tools are used (Garina et al. 2017).

2 Materials and Method

The influence of the most accurately chosen structure is great and has high economic and financial significance (Chelnokova et al. 2017). A measure of return on equity is used to determine the level of impact on the financing activities effectiveness. Calculation of the indicator is calculated with values of net profit and profit after payment of interest.

$$Profitability\,CL = Rcl = \frac{(P - r \times BC) \times (1 - NP)}{CL} \tag{1}$$

NP—the tax rate, which is paid from the profits of the company, expressed as a decimal; r—weighted average rate of interest; P—profit, thousand rubles; BC—borrowed capital, thousand rubles; CL—equity, thousand rubles.

Next, this indicator should be considered in conjunction with the level of financial risk, that is, an indicator of risk profitability. The value of this indicator must be at maximum, in which case the structure is optimal. This value is calculated by the formula:

$$PP = \frac{Return\,on\,equity}{Financial\,risk\,level} = \left[\frac{(P - r \times BC) \times (1 - np)}{CL}\right]$$

$$\div \left[\left(r - r^{br} \right) \times \frac{BC}{CL + BC} \right] \quad (2)$$

where r^{br}—the risk-free rate of return on the financial market, expressed as a decimal; $\frac{BC}{CL+BC}$—level of financial risk.

The next indicator for determining the capital structure is the rate of return on invested capital. The formula for calculation:

$$\text{Сок} = \frac{CL+BC}{(P^{ч} - r \times BC) \times (1 - np)} \quad (3)$$

As in any analysis, when assessing the optimal structure, the process and essence are considered in detail.

The very methodology for calculating the optimal capital structure implies: the initial stage is the determination of the need for capital investments, which are not affected by the ability to use financing from different sources. Next, the maximum possible cost of equity in the total amount of required capital is estimated. The indicators are calculated: risk profitability for possible ratios of equity, borrowed capital, and the rate of return on invested capital. At the final stage, indicators are evaluated. For an optimal structure, the values must meet the criteria: the maximum value of return on risk and the minimum value of return rate of invested capital in the aggregate.

This analysis is recommended to justify the optimal structure of the following indicators: return on equity, economic profitability, and financial leverage.

3 Results

The study was conducted on the basis of CityMedia LLC, a company that is a highly reliable supplier of projection and interactive equipment. The company provides services for the sale, design, installation, and full customization of the supplied equipment. It occupies 2327 place in the region of Nizhny Novgorod region, and 13th place in the category of computers and accessories, computer equipment, office equipment.

The aggregate of mentioned indicators makes it possible to estimate the effect of a specific variant of the ratio of own and borrowed funds in CityMedia LLC (Table 1).

Equity with a share of 80%: $9882 \times 0.8 = 7906$.

The amount of borrowed capital with a share of 20%: $9882 - 7\,906 = 1976$.

Return on equity at 20/80: $((9998 - 0.3 \times 7554.4) \times (1 - 0.24)) / 30{,}218 = 0.19$.

The level of financial risk at 20/80: $(0.3 - 0.15) \times 7554.4 / 37{,}772 = 0.03$.

Risk profitability indicator at 20/80: $0.19 / 0.03 = 6.48$.

Table 1 Assessment of the optimal capital structure of the company

Capital structure (%) (Borrowed funds/Equity)							
Indicators	0/100	20/80	40/60	50/50	60/40	80/20	100/0
Initial data for the analysis of invested capital							
1. Capital need, (thousand rubles.)	37,772	37,772	37,772	37,772	37,772	37,772	37,772
2. The size of equity capital, (thousand rubles)	37,772	30,218	22,663	18,886	15,109	7554	0
3. The size of borrowed capital, (thousand rubles)	0	7554	15,108	18,886	22,663	30,217	37,772
4. The risk-free rate of profitability, in shares	0.15	0.15	0.15	0.15	0.15	0.15	0.15
5. The average interest rate on borrowings financing (share)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
6. The annual profit before tax, (thousand rubles)	9998	9998	9998	9998	9998	9998	9998
7. The rate of tax and other deductions from profit, income tax, (shares)	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Analytical indicators							
8. Return on equity, (shares)	0.20	0.19	0.18	0.17	0.16	0.09	–
9. Financial risk level (share)	0	0.03	0.06	0.075	0.09	0.12	0.15
10. The indicator of risk margins (share)	–	6.48	3.06	2.32	1.79	0.78	–
11. The rate of return on invested capital (years)	4.97	6.43	9.09	11.47	15.54	53.29	−37.27

Source Developed and compiled by the authors

The rate of return on invested capital at 20/80: 37,772 / ((9998–0.3 × 7554.4) × (1 − 0.24)) = 6.43.

Thus, an assessment of the optimal capital structure showed that this company is recommended to generate borrowed capital of 60% (or less) to equity of 40%. This option is the most optimal structure, as compared with the ratio 80/20 risk score margin has the maximum value, and the refund rate has the minimum value (Yashina et al. 2020).

Modern conditions of crisis in which enterprises and organizations operate determine the low level of use of basic and current assets, primarily due to the deterioration of economic conditions in realization of activities, growth of the cost of production resources, exacerbation of the marketing problem of products in the conditions of declining demand. In order to increase the level of capital utilization, it is necessary to increase the value of indicators characterizing the company's business activity (Romanovskaya et al. 2020; Smirnova et al. 2017).

The following proposals can be implemented in order to improve the efficiency of capital and its allocation in the enterprise: one of the model proposals for efficiency improvement is the optimization of fixed assets, as a result, it increases the size of

Table 2 Categories of improving capital efficiency

Intensive	Extensive
Investments in capital	Lease of unused space and equipment
Technical re-equipment, improvement of the process equipment system	Reduce loss of working time, whole and in-shift downtime
Acquisition of the latest high-tech work items	Shift ratio increase
Increasing equipment use at maximum power	Improving fixed capital exploitation
Depreciation increase	Timely and quality repair work
Optimization of capital structure, the proportion between fixed and working capital, tangible and intangible assets plus their components	Increased load of fixed capital and production capacity
Investment in human potential	
Effective management and active marketing	
Diversification of production	

Source Developed and compiled by the authors

output without additional investments in capital and in a shorter time. There is an increase in the pace of production activity and cost reduction. As part of this proposal, the enterprise is recommended to expand the scale of its production, which will help to occupy a large part of the market and strengthen its position, for example, open branch offices in other cities of Russia.

The main aspects and opportunities for improving the efficiency of capital turnover are divided into categories such as intensive and extensive (Table 2).

One of the problems of many enterprises is a large amount of receivables. It is necessary to strengthen the processes of timely debt collection by debtors—this is one of the standard solutions for optimizing the use of capital. As part of the analysis of the size of receivables, it is proposed to develop a billing control program. It will display a unified list of buyers, billing date, closing obligations date, and contact person. If the value of receivables is high, it is recommended to ensure control over the timely invoicing advance payments and the final payment on a daily basis to view invoices and to remind customers of the need to pay their bills. Also, the enterprise can use a financial instrument such as factoring. It is a banking product, a mortgage-free form of financing, where the buyer receives a significant installment payment. This tool will allow controlling receivables and making full use of cash resources received.

It is recommended to carry out an increase in equity of the procedure in order to enhance financial stability, as well as increase the value of the reserve fund. The value of own resources can be increased due to the revaluation of retained earnings, and the formation of substantial reserves.

Capital structure as the main indicator of business capital formation plays an important role in the whole company. At present the company has a capital structure expressed in a ratio of 26% equity to 74% of the borrowed funds. By evaluating the optimal capital structure of this enterprise, we can conclude that with the

recommended structure of 60/40%, the company is recommended to reduce debt and increase its own capital. It is important to note that, according to the analysis of financial statements, the high cost of accounts payable is identified.

Minimization of the above debt obligations is a prerequisite for attracting new borrowed funds. Analysis of financial activity showed that some of the indicators have a deviation from the accepted norms (Table 3).

From the analysis of the balance sheets, we can conclude that the account payable of the company LLC "CityMedia" has a significant value. Provided that it has a tendency to decrease, it is necessary to take measures to optimize these obligations. A situation where the accounts payable amount exceeds the value of trade liabilities is positive and shows that the company has working capital. But it is not necessary to ignore creditor obligations, as significant growth can provide companies with insurmountable difficulties.

Recommended activities for accounts payable management:

- Based on the business environment of the enterprise, to determine the rational structure of accounts payable and regularly analyze the relation between their obligations;
- Avoid overdue accounts payable, entailing the risk of suspension or termination of activities;

Table 3 Assessment of changes in financial performance

Indicator	At the beginning of the year	At the end of the year	Absolute deviation	Norm
1. Concentration ratio of equity	0.06	0.26	+0.2	Not lower than 0.5
Trend assessment: this ratio shows the share of assets covered by own funds. In the trend, the growth of this indicator does not reach the normative value, this is evidence that the company is characterized by financial instability. But it is worth noting that the industry in which the CityMedia LLC operates does not place high demands on this indicator				
2. Current liquidity ratio	1.08	1.36	+0.28	1.5–2.5
Trend assessment: The non-compliant ratio (below 1) shows possible difficulties in closing its current liabilities. It is recommended to ensure the growth of current assets more intensively than the growth of short-term liabilities. Reducing the value of short-term liabilities, which, in particular, can be achieved by transferring some of them into long-term (e.g., debt on borrowed funds)				
3. The overall solvency ratio	0.43	0.74	+0.31	1–2
Trend assessment: Normative value for overall solvency ratio > 2. This inequality will be fulfilled only when the company is financed from its own sources at least 50%. According to Sheremet, the main factor that determines the overall solvency is the presence of the company's own capital				

Source Developed and compiled by the authors

- Periodically calculate the turnover of accounts receivable and accounts payable, adjust commercial terms of deferred payment with customers and suppliers;
- To carry out an inventory of receivables and accounts payable and to take timely action for debt settlement.

4 Conclusion

With the implementation of the above measures, the company provides an increase in the level of capital use. Rational use of capital gives the company a positive effect on profit.

Modern conditions of existence do not always satisfy the projected figures, this is due to the fact that the market has its own characteristics. The following promising areas for increasing the efficiency of used capital in CityMedia LLC should be highlighted.

1. Attracting investors. To implement this measure, it is necessary: at the initial stage, draw up a competent business plan that contains a description of the company's activities, calculation of required investments, income analysis, payback period, and business prospects. Next, the form of profit by the investor from the investment is chosen. There are three main ways: deduction of interest from the invested amount; percentage of company profits; share in the business. The most important and most unpredictable is the stage of negotiations. As a result, a decision is made on cooperation.
2. Increase in the current liquidity ratio. Consider several ways to increase the ratio:
   - Reducing the amount of accounts payable due to its restructuring by netting or write-offs as unclaimed;
   - An increase in current assets;
   - An increase in current assets and at the same time a reduction in accounts payable.
3. An effective measure for the enterprise is to increase the productivity of assets, which will entail an increase in the volume of profit without increasing resources. At the same time, it is important to pay attention not only to the quantitative side but also to the qualitative, namely, optimizing the use of assets. Ignoring this factor can negatively affect the result of activity and act as a lost profit.
4. It is possible that product promotion is organized at the proper level, and the company took the highest possible share of the market, but profits still low. The reason for this situation may be high costs. These are inflated prices for raw materials, materials, components, services installed by suppliers. In this case, the option of reducing costs is to find suppliers that have lower prices.

The effectiveness of the indicators values is presented in Table 4.

Table 4 The effectiveness of indicators values

Indicator	Options	The present value	Planned value	Change
1. Current liquidity ratio	1. Reduction in accounts payable through restructuring	1.36	2	Reduce accounts payable by 8804 thousand rubles
	2. The increase in current assets	1.36	2	Increase the value of working capital by 17,788 thousand rubles
	3. Increase in current assets and decrease in accounts payable	1.36	2.1	Increase the value of current assets by 3050 thousand rubles, reduce accounts payable by 9160 thousand rubles

Source Developed and compiled by the authors

Since the normative value of the current liquidity ratio is 2 for a fixed amount of current assets of 37,570 thousand rubles, accounts payable will be equal to 37,750/2 = 18,875 thousand rubles. Conclusion: it is recommended to reduce accounts payable by 8 804 thousand rubles.

With a fixed value of accounts payable 27,679 thousand rubles, the value of current assets should be 27,679 × 2 = 55,358 thousand rubles. Conclusion: it is recommended to increase the value of current assets by 17,788 thousand rubles.

It is recommended to increase the value of current assets by 3050 thousand rubles, and reduce payables by 9,160 thousand rubles, then the current ratio will be 2.1.

Rate increase makes the company more attractive for investors, which could give more leverage additional financial resources and to enhance their value in the market and profitability growth.

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Cross-Border Cooperation and Its Impact on Business Competition

Evgeny E. Shvakov, Valentina Yu. Dianova, Lyubov V. Teplova, Konstantin Y. Tatarov, and Sergey A. Kurnosov

Abstract This study examines different fields of cross-border cooperation and their impact on competition in business in developed and developing countries. Using the correlation analysis method, we determined the connection between different fields of cross-border cooperation and business competition in developed and developing countries. This allowed us to identify the most influential fields of cross-border cooperation. Via regression analysis, we traced the impact of these fields in all countries of the sample, establishing the prospects for optimizing the impact in various developed and developing countries. The results indicate that cross-border cooperation generally has a positive effect on competition and follows the second model both in developed (average correlation of 7.02%) and in developing countries (average correlation of 11.78%). We confirmed that the impact of different areas of cross-border cooperation on competition is highly differentiated in developed (variation of 762.99%) and in developing countries (variation of 550.41%). We established that cooperation in the fields of finance and manufacturing have a universal positive influence on competition. Moreover, we proposed several recommendations on developing these fields to maximize the level of competition in developed and developing countries.

Keywords Cross-border cooperation · Competition · Business and entrepreneurship · Developed countries · Developing countries

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1 Introduction

Cooperation and competition are closely related in the conditions of a market economy: cooperation changes the level of market concentration and modifies the competition in the business environment; competition, in turn, encourages or prevents business structures from cooperating. Two models of cooperation between business structures can be distinguished, depending on their impact on competition. The first model of cooperation is total, which leads to market monopolization, reduction in market concentration, and suppression of competition. In this case, maintaining market efficiency requires anti-monopoly regulations.

The second model of cooperation is selective and flexible. Cooperation of this type focuses not on mergers and acquisitions but on the joint implementation of some business projects. In this case, the market concentration remains at the same level, and competition becomes more complex and robust. However, it is difficult to differentiate between these models in practice, especially if the cooperation is international. Most existing studies consider the topic in a shallow and generalized way, even though cooperation can affect different fields, each with their own impact on competition.

Current economic systems trend towards universalization; this fact also hinders all efforts to clarify the meaning and the essence of cooperation. The impact of cooperation on competition depends on the effectiveness of market institutions and the maturity of the free economy, meaning that cooperation can have different consequences in developed and developing countries. To address this problem, our study presents an in-depth and detailed analysis of the cross-border cooperation between business structures in the context of developed and developing countries.

In this study, we present the following hypothesis, "The impact on competition varies significantly between the fields of cross-border cooperation. In the developed countries, cross-border cooperation mainly follows the second model due to robust market institutions and long traditions of free market—cooperation strengthens competition. In the developing countries, cross-border cooperation follows the first model due to the reduced efficiency of market institutions and developing markets—cooperation hinders competition." In this paper, we aim to investigate the specific features of different fields of cross-border cooperation and their impact on business competition in developed and developing countries.

2 Literature Review

Conceptual and applied questions of cross-border cooperation between businesses are a subject of many scholarly studies (Alekseev et al. 2020; Amountzias 2020;

Bintoro et al. 2020; Franco and Haase 2020; Kamarudin et al. 2020; Kardes et al. 2020; Kim et al. 2020). Specific features of competition among business structures in various modern economic systems are studied in the works of several Russian and foreign scholars (Meng and Wu 2020; Ouyang et al. 2020; Pereira et al. 2020; Popkova and Bogoviz 2020; Pu et al. 2020).

Nevertheless, the relationship between cooperation and competition remains poorly understood, especially at the empirical level. First of all, cross-border cooperation (as a sub-class of cooperation) is poorly studied. Second, the differences in the impact of different fields and industries are only vaguely understood. Third, the discrepancies between the impact of cross-border cooperation in developed in developing countries are practically unresearched. This study aims to fill these gaps in knowledge.

3 Materials and Methods

We tested the hypothesis using the correlation analysis method, which allowed us to establish a link between the different fields of cross-border cooperation and business competition in developed and developing countries. If the hypothesis is correct, then, first of all, the variation coefficient of different cooperation fields will be high (more than 50%)—this would point to the strong variability of cooperation impact for different fields.

Second of all, the mean value of the correlation coefficient in developed countries will be positive (which points to increased competitiveness), and negative in the developing countries (which points to suppressed competition). The study sample was formed by five developed and five developing countries with the highest globalization coefficient in their respective groups (according to 2020 data). The sample is presented in Fig. 1.

Figure 1 shows that, overall, developed countries have a higher and more consistent level of globalization (90.15 points on average) compared to developing countries (75.51 points on average). However, all sampled countries are globalized enough to serve as subjects for researching cross-border cooperation. The empirical basis of this study is provided in Table 1.

Using the correlation analysis, we identified the fields of cross-border cooperation that have the most positive impact on competition in both developed and developing countries. Using regression analysis, we managed to clarify the impact of the selected fields on competition in all sampled countries; furthermore, we determined the prospects for optimizing this impact in the groups of developed and developing countries separately.

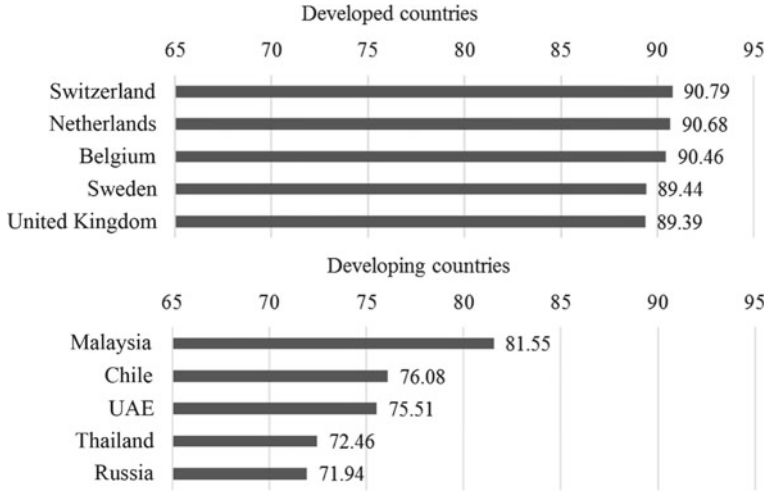

Fig. 1 Globalization index in the sampled developed and developing countries in 2020, 1–100 points. *Source* Compiled by the authors based on KOF (2020)

4 Results

We processed the data from Table 1 using the correlation analysis method; the results are presented in Fig. 2.

According to Fig. 2, the field of cross-border cooperation that has the most impact on competition is manufacturing—its correlation with the competition is 85.92% in the developed countries and 70.95% in the developing countries. We will label the manufacturing field of cross-border cooperation as X_1. The second most impactful field of cross-border cooperation is finance; we will label it as X_2. Its correlation with competition in developed countries is 21.73%, and 60.28% in developing countries.

Some fields of cross-border cooperation only positively influence competition in developed countries (technology: correlation of 4.80%) or in developing countries (marketing: correlation of 31.73%). Overall, both groups of countries had a positive correlation between cross-border cooperation and competition: 7.02% for developed countries and 11.78% for developing countries. The inter-field variation of the correlation coefficients was extremely high (762.99% in developed countries and 550.41% in developing countries).

We used the method of regression analysis to obtain an economic-mathematical model of the impact of two selected fields of cross-border cooperation on competition in all sampled countries. The model follows the Formula 1:

$$y = 73.72 + 0.38 \times X_1 + 0.09 \times X_2 \quad (1)$$

According to the formula, increasing foreign direct investments (FDI) by 1% of GDP raises competition by 0.38 points. Increasing high-tech net exports by 1% of the

Table 1 Fields of cross-border cooperation and competition among businesses of the sampled developed and developing countries in 2020

Country		Fields of cross-border cooperation in business					Intensity of local competition, 1–100 points
		Finance	Technology	Innovation	Marketing	Manufacturing	
		Foreign direct investments, % GDP	Intellectual property receipts, % total trade	Global R&D companies, avg. exp. top 3, mln USD	Global brand value, (top 5,000), % GDP	High-tech net exports, % total trade	
Developed countries	Switzerland	3.7	5.6	91.3	234.5	7.2	75.5
	Netherlands	5.4	7.2	83.0	153.4	11.1	80.5
	Belgium	−2.2	0.8	66.3	58.9	7.9	78.6
	Sweden	2.9	3.3	79.0	214.0	7.0	75.1
	United Kingdom	5.9	2.5	84.8	167.2	8.8	79.9
Developing countries	Malaysia	3.3	0.1	37.4	158.9	38.6	76.7
	Chile	3.0	0.1	0.0	43.6	0.8	74.5
	UAE	2.6	1.0	67.6	128.9	0.2	71.0
	Thailand	1.7	0.0	0.0	63.9	14.4	74.2
	Russia	1.6	0.2	39.1	49.6	2.4	70.9

Source Compiled by the authors based on the data of the World Intellectual Property Organization (WIPO 2020)

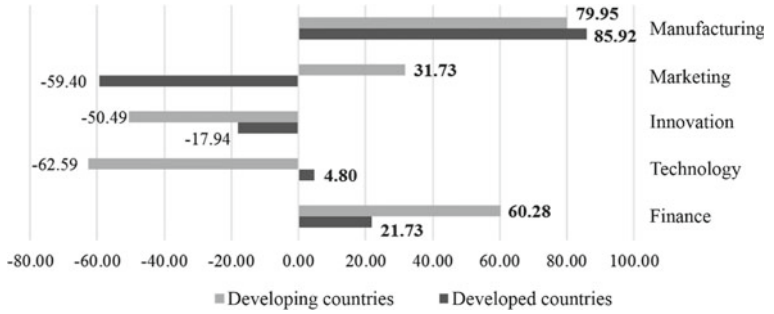

Fig. 2 Correlation between the fields of cross-border cooperation and competition in the sampled developed and developing countries in 2020, %. *Source* Compiled by the authors

total trade raises competition by 0.09 points. Using the simplex method and Formula 1, we determined the optimal volume and increase of cross-border cooperation in the fields of finance and manufacturing that would maximize competition (increase to 100 points). The results are presented in Figs. 3 and 4.

Figure 3 demonstrates that to maximize (increase by a factor of 1.28) competition in developed countries, cross-border cooperation in finance must be increased by a factor of 15.30 (until FDI reaches 48.04% of GDP). Meanwhile, cooperation in manufacturing must be increased by a factor of 10.48 (until high-tech next exports reach 88.02% of total international trade).

As shown in Fig. 4, maximizing competition in developing countries (increasing by a factor of 1.36) requires raising financial cooperation by a factor of 19.49 (until FDI reaches 47.55% of GDP) and cooperation in manufacturing by a factor of 7.98 (until high-tech next exports reach 90% of total international trade).

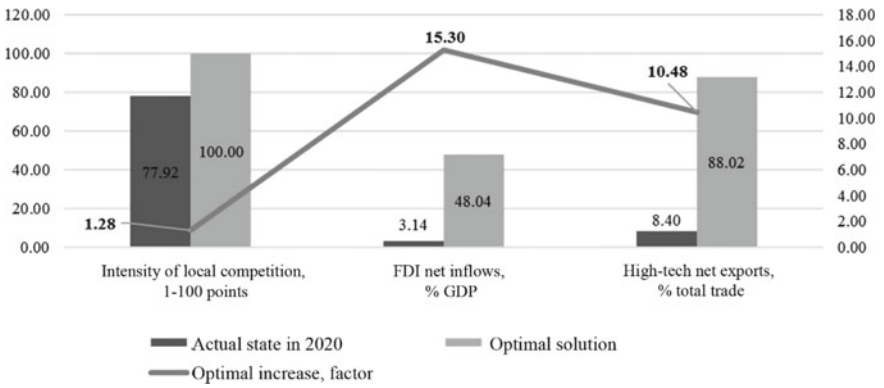

Fig. 3 Optimal solutions to maximizing competition in developed countries by expanding cross-border cooperation. *Source* Compiled by the authors

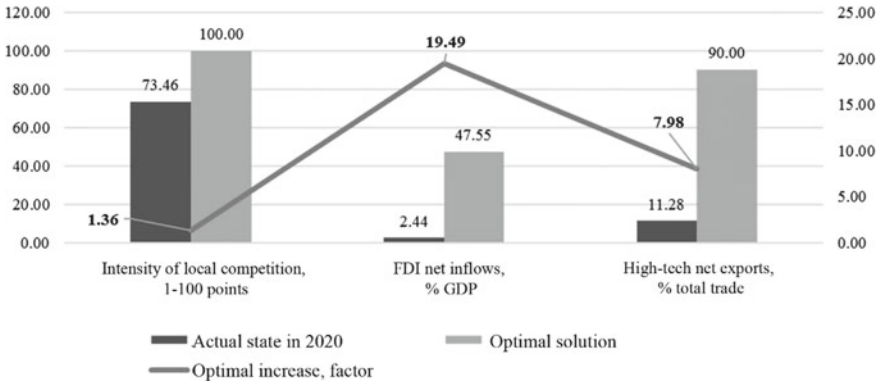

Fig. 4 Optimal solutions to maximizing competition in developing countries by expanding cross-border cooperation. *Source* Compiled by the authors

5 Conclusion

These results disprove the hypothesis by demonstrating that cross-border cooperation has a generally positive effect on business competition—an average correlation of 7.02% in developed countries and 11.78% in developing countries. Cross-border cooperation follows the second model (selective and flexible) in both developed and developing countries. At the same time, the impact of different fields of cross-border cooperation varies significantly in both developed (762.99% variation) and developing (550.41% variation) countries.

We established that the fields of cross-border cooperation with the most positive and universal influence on competition are: finance and manufacturing. Moreover, we proposed recommendations on developing these fields for maximizing business competition in both developed and developing countries.

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University-Business Cooperation and Its Significance for the Development of Innovative Economy

Sergey K. Kleschev, Rushaniya Iskandarova, Elena M. Kryukova, Valeriya Sh. Khetagurova, and Mikhail Yu. Zakharov

Abstract The study aims to scientifically substantiate the creation of a system of state management for university-business cooperation to promote the development of the innovative economy. The study employs the methods of correlation analysis and regressive analysis. The sample consists of five developed and five developing countries that lead in the ease of doing business index in their respective groups (2020 data). The results show that university-business cooperation is important for the development of the innovative economy (regression of 1.2118%, correlation of 44.37%). In developed countries, the key factor of university-business cooperation is knowledge-intensive employment (correlation of 65.58%). To raise the development level of the innovative economy to 55.57%, we recommend increasing knowledge-intensive employment by 161.23%. In developing countries, university-business cooperation was more important for the development of the innovative economy. In these countries, the most impactful factor is ISO 9001 quality certification (correlation of 81.27%). To raise the development level of innovative economy in these countries to 89.647%, we recommend increasing raising the number of issues ISO 9001 certificates to 56.03 per 1 bln. USD of GDP adjusted to purchasing power parity.

Keywords Cooperation · Collaboration · Universities · Enterprises · Innovative economy · Developed countries · Developing countries

JEL Codes C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

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1 Introduction

University-business cooperation (UBC) allows entrepreneurs to delegate risks and responsibilities of research, development, and innovative integration to universities. Small and medium-sized enterprises (SMEs) benefit from such cooperation the most since the majority of these businesses cannot afford to have their own research and development facilities. SMEs are especially receptive to innovations, needing them to stay flexible and adapt to new market conditions. Furthermore, universities benefit from this process by effectively commercializing the created innovations.

However, the theoretical basis of UBC contradicts its practical implementation. The market mechanism is unable to create natural incentives for the mass cooperation of universities and business structures. This is one of the market's "failures" that are yet to receive a scientific explanation. Enterprises tend to either refuse to implement innovations or borrow ready-made innovative solutions from competitors, which is especially common for developing countries. Universities, in turn, sign cooperation agreements with businesses mainly to improve their position in university rankings and meet the government requirements for subsidies and grants.

Because of these reasons, UBC is rare or used just as a formality. Solving this problem requires imposing government regulations, which is complicated by the lack of a scientific-methodical foundation. First of all, the impact of CpUB on the development of innovative technology and, therefore, its potential benefits are only vaguely understood. Second, the pre-conditions for the effective promotion of UBC are largely unknown.

Third, the differences in the practical application of UBC in developed and developing countries (as well as whether it is worthwhile to consider these differences in imposing government regulations) are insufficiently researched. This study aims to mend these gaps in scholarly knowledge by providing comprehensive scientific guidelines for the government regulation of UBC.

2 Literature Review

The topic of UBC was featured in many scholarly studies (Bogoviz 2019, 2020a, b; Butorin and Bogoviz 2019; Fonina et al. 2019). Theoretical and practical issues of innovative economic development are studied in the works of several Russian and foreign scholars (Massoud et al. 2019; Piekarski et al. 2019; Popkova 2020; Popkova et al. 2020; Wong et al. 2018). Nevertheless, there are several unresearched topics at the intersection of these areas of scholarly knowledge, namely:

- Influence of UBC on the development of the innovative economy;
- Factors and possible ways of promoting UBC;
- Specific features of UBC in developed and developing countries;
- This paper addresses all of these research gaps.

3 Materials and Methods

The working hypothesis of this study consists of three postulates:

1. UBC is important for the development of the innovative economy; therefore, promoting this practice is worthwhile. We will try to prove or disprove this postulate via the method of regression analysis. If the postulate is correct, the regression dependence between the indicator of innovative economy development (IED), represented by the share of high- and medium–high-tech manufacturing, and the UBC index (UBC_I) will be positive;
2. UBC can be promoted by stimulating such factors as knowledge-intensive employment (KIE), firms offering formal training (FOT), ISO 9000 certificate registration (QSC), and research talents of enterprises (RTP). This postulate was tested using the method of correlation analysis. If the postulate is correct, then the correlation of these factors with the UBC index (UBC_I) will be more than 50%;
3. There is a difference between practices of UBC in developed and developing countries, which must be accounted for in the government regulations. We tested this postulate by means of correlation analysis. If the postulate is correct, the key factors (more than 50% correlation) in developed and developed countries will differ.

The study sample consists of five developed and five developing countries with the highest values of the ease of doing business index in their respective groups, according to 2020 data (Fig. 1).

According to Fig. 1, the ease of doing business in the sampled countries is quite high: with an average of 85.26 points in developed countries and 79.46 points in

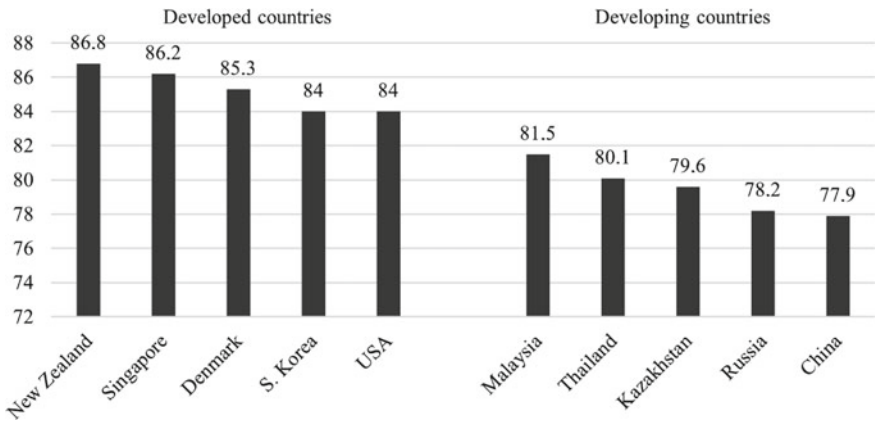

Fig. 1 Values of the ease of doing business index in sampled countries, 1–100 points. *Source* Compiled by the authors based on World Bank (2020)

developing countries. The empirical data on the sampled countries are presented in Table 1.

4 Results

To test the first postulate, we applied the method of regression analysis to data from Table 1. The results are presented in Fig. 2.

Figure 2 demonstrates that when the UBC index increases by 1 point, the share of high- and medium–high-tech manufacturing rises by 1.2118%. This confirms the first postulate. To test the second and third postulates, we applied the correlation analysis method to Table 1 data. The results are presented in Fig. 3.

According to Fig. 3, the key factor of UBC in developed countries is knowledge-intensive employment (KIE) (65.58% correlation). In developing countries, the key factor is ISO 9001 quality certificates registration (QSC) (81.27% correlation). These figures confirm the second and third postulates. Regression dependence between UBC and the selected factors is presented in Fig. 4.

Building upon the regressions in Fig. 4, we outlined the prospects of increasing innovative economic development in developed (Fig. 5) and developing countries (Fig. 6) by promoting the key factors of UBC.

Figure 5 demonstrates that maximizing knowledge-intensive employment (100% staffing in enterprises, up by 161.23%) increases UBC activity by 7.94% to 71.89 points. This, in turn, raises the innovative economy development indicator by 14.49 to 55.57%.

According to Fig. 6, the maximum activity of UBC (100 points, + 87.55%) can be achieved by increasing the registered ISO 9001 quality certificates by 843.26% to 56.03 per 1 bln. USD of GDP adjusted to purchasing power parity. This would increase the innovative economy development indicator by 165.99 to 89.64%.

5 Conclusion

The results confirm all three postulates of the working hypothesis. In general, UBC is important for innovative economy development (regression of 1.2118%, correlation of 44.37%). In developed countries, the key factor of UBC development is knowledge-intensive employment (correlation of 65.58%). To increase the innovative economy development indicator to 55.57%, we recommend raising the knowledge-intensive employment indicator to 161.23%.

In developed countries, UBC is even more important for innovative economic development. In their case, the key factor of UBC is the registration of ISO 9001 quality certificates (correlation of 81.27%). Increasing the innovative economy development indicator to 89.647% would entail raising the number of registered certificates to per 1 bln. USD of GDP adjusted to purchasing power parity.

Table 1 University-business cooperation, its factors, and the innovative economy development in sampled countries in 2020

Country		Innovative economy development indicator		Factors of UBC			
		University-business cooperation index, 1–100 points	High- and medium–high-tech manufacturing, %	Knowledge-intensive employment, %	Firms offering formal training, %	ISO 9001 certificates, registrations per 1 bln. PPP$ of GDP	Research talent, % in business enterprise
		(UBC_I)	(IED)	(KIE)	(FOT)	(QSC)	(RTB)
		5.2.1	6.2.5	5.1.1	5.1.2	6.2.4	5.3.5
Developed countries	New Zealand	59.5	14.1	–	–	5.1	31.2
	Singapore	71.3	77.7	56.9	–	5.4	49.9
	Denmark	69.1	42.2	47.0	–	7.4	60.5
	South Korea	57.4	56.7	39.5	–	6.3	82.0
	USA	75.7	52.0	48.0	–	1.1	71.3
Developing countries	Malaysia	68.3	43.1	27.2	18.5	9.4	21.9
	Thailand	54.1	43.8	13.8	18.0	6.4	60.8
	Kazakhstan	40.9	9.6	34.3	21.8	1.1	–
	Russia	46.8	25.6	44.1	11.8	1.1	44.2
	China	56.5	46.4	-	79.2	11.7	61.3

Source Compiled by the authors based onWIPO (2020)

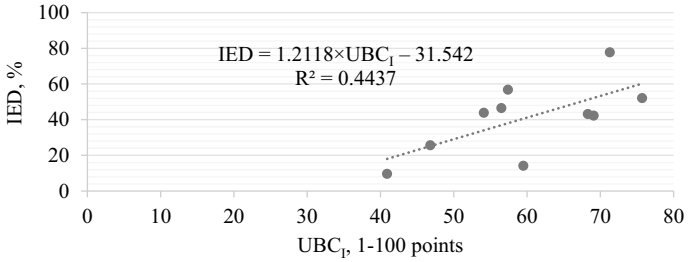

Fig. 2 Regression dependence between the share of high- and medium–high-tech manufacturing and university-business cooperation. *Source* Compiled by the authors

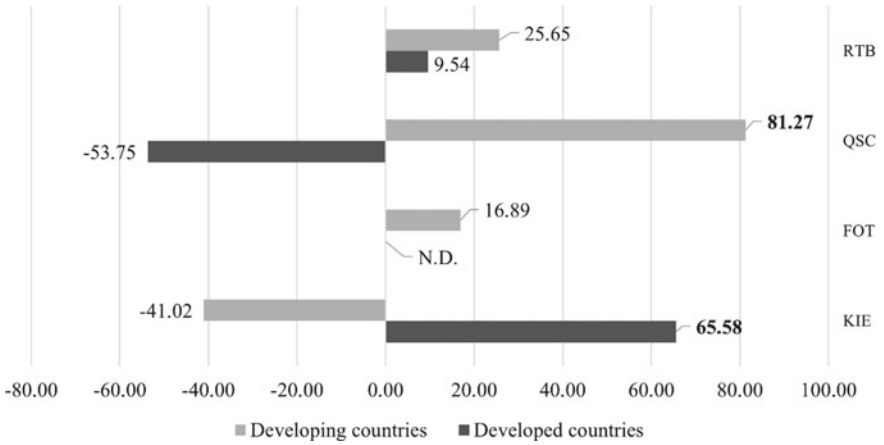

Fig. 3 Correlation of university-business cooperation with its factors in developed and developing countries, %. *Source* Compiled by the authors

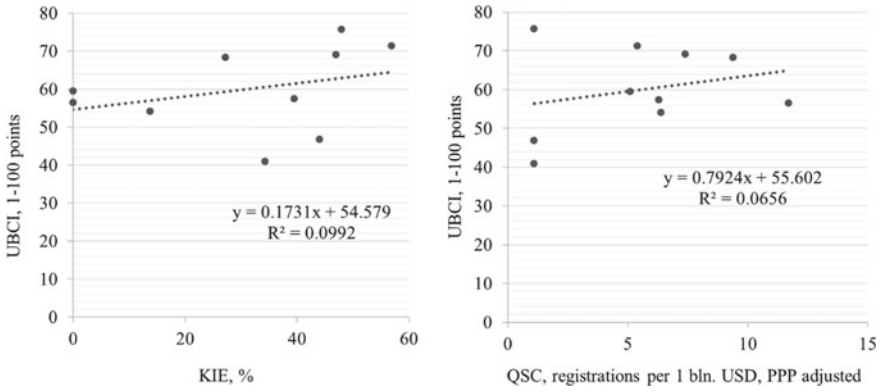

Fig. 4 Regression dependence between university-business cooperation and the selected factors. *Source* Compiled by the authors

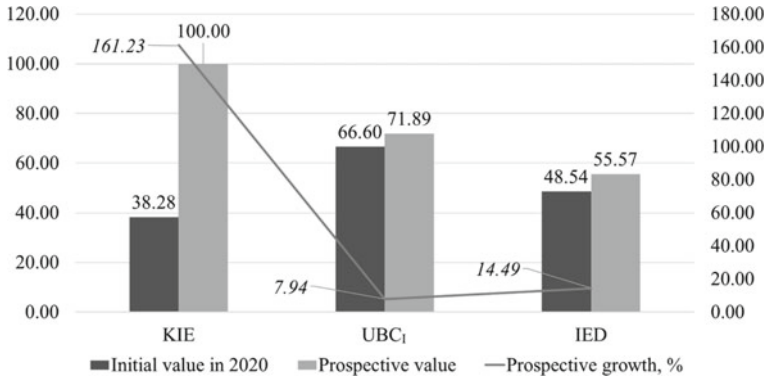

Fig. 5 Prospects of increasing innovative economic development in developed countries by promoting key factors of university-business cooperation. *Source* Compiled by the authors

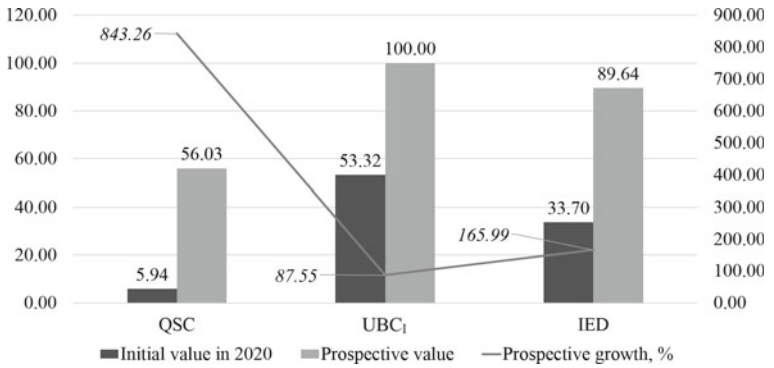

Fig. 6 Prospects of increasing innovative economic development in developing countries by promoting key factors of university-business cooperation. *Source* Compiled by the authors

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Assessment and Management of the Tax Burden: The Hidden Potential for Growth of Socio-economic Development of the Country

Irina A. Zhuravleva, Natalia A. Nazarova, and Aleksandr V. Gurnak

Abstract The scientific research examines the theoretical aspects and practical conclusions of the relationship and interdependence of the elements of assessment and management of the tax burden in the company and on the country's economy. The authors focus on the transformation of the tax system based on the effective functioning of its elements, one of which is the Assessment and Management of the Tax Burden of a Company (AMTBC). The purpose of the article is to carry out an econometric analysis of the assessment and management of the company's tax burden on the basis of the elements of the AMTBC systemonomic model. We show the importance of AMTBC from a practical and economic standpoint, as well as the foundations based on systemonomy, rooted in the uniform universal laws of the world in a philosophical way. The objective of the research is to study the elements of the AMTBC in the structure of the tax system, to approve the investigated systemonomic model of AMTBC based on a mathematical multifactor model. General scientific methods were applied to the scientific object of the research.

Keyword Effectiveness of the tax system · Tax burden · Development of the tax system · Systemonomic model · Tax burden management

JEL Codes H20 · H21 · H29 · H30

1 Introduction

In their works, W. Petty, A. Smith, and D. Ricardo scientifically and economically considered the issues of the need to measure and the impact of the tax burden on the economy of companies. Developing further scientific research in this direction, the

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assessment of the tax burden in their works paid attention to S. Montesquieu, Zh. Sey, L. Mises, F. Yusti, A. Pigou, A. Benefeld, P. Leroy-Beaulieu, and A. Singh.

Note the inconsistency of scientific judgments and the reality of economic processes "the burden of taxation is characterized by its impact on the well-being of people (not institutions) acting as consumers, producers and suppliers of factors of production" (Mayburov 2018). According to J. King, the company "is just a "channel" through which streams of income go to individuals who ultimately own it" (Mayburov 2018). The conclusion is brewing: the company in reality cannot be the bearer of the tax burden. Individuals are, in fact, the object of the question. There can be no talk about the tax burden on the organization due to such a tax shift.

What is the "tax burden"? This term is widely used in the modern theory of taxation. And it is important in the aspect of studying and developing the tax collection system. But what is the feasibility, and how justified is the need to include AMTBC in the tax environment? The fact is that there are a number of fundamental points that distinguish individuals from legal entities: the size of the organizational and legal form of ownership, methods of calculation, building a model, and some others.

Many scientific publications are devoted to the problem of assessment (measurement), management, methods of calculating the tax burden on an enterprise; we will talk about them below, as well as about economic models in this part of the tax industry, and propose the author's systemonomic model of the AMTBC.

Analyzing the effect of taxation on the economy as a whole, the following should be noted: foreign financial science calls it "tax economics", considering separately the impact of taxes on various economic processes and phenomena (for example, personal income tax on the labor market, indirect taxes—to commodity markets) (Zhuravleva and Nazarova 2020). Determining the tax burden on the economy, the effect of the cumulative impact of taxes on socio-economic processes is considered. And here it would be appropriate to talk about the economic, fiscal and price indicators that characterize the quantitative aspects of the perception of the tax burden.

S. Barulin expressed the opinion that the economic indicator of the tax burden, or burden, is "a form of monopoly price of aggregate public goods, which expresses the measure of the value of public services" (Mayburov 2018), which consists of real and nominal tax burden. The difference between the tax burden in reality and the nominal one is marked by the fact that the indicator of the real burden is calculated as the ratio of the amount of the amount of actually paid tax payments to the value of the corresponding result of activities. When calculating the nominal tax burden, the denominator remains the same value, and the numerator is the amount of accrued tax payments.

For economic agents, public goods, financial support (direct and mediocre) are provided, and thus, the fiscal indicator of the tax burden in relation to the GDP created in the country's budget is centralized and socialized and the corresponding redistribution of the public part of GDP through this system.

Figure 1 reflects the total tax burden of Russia for 2012–2018, fiscal and in% of GDP, which show that the tax burden on the economy in its aggregate is higher, has been growing over the past four years.

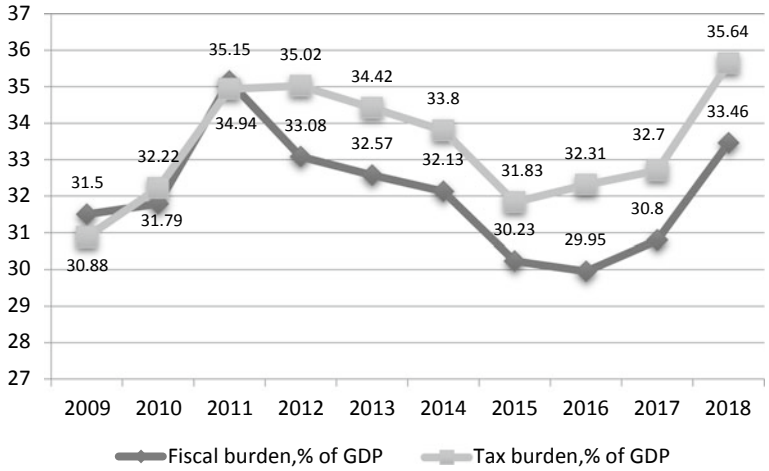

Fig. 1 Fiscal and tax burden in Russia 2012–2018, %. *Source* Compiled by authors

In the period from 2012 to 2017, the tax burden was not recorded less than 29.95% of GDP (the Ministry of Finance takes into account insurance premiums, customs duties, taxes and fees, and all mandatory payments when calculating). In 2018, the load exceeded 32.7%, having increased by 2.4%. It grew by 2.4% and exceeded 32.7%. This growth is explained by the Ministry of Finance by an increase in the exchange rate and coefficient in the formula for calculating the MET rate for oil production, and an increase in tax revenues, in particular, on value added tax due to the consolidation of ASK VAT-2.

According to the financial and credit encyclopedic dictionary edited by Gryaznova, the tax burden is a generalizing characteristic of the state tax system (Gryaznova 2004), which indicates a qualitative and quantitative assessment of the effect of taxes as a taxpayer, and on the national economy as a whole. The term contains both a qualitative interpretation of the concept and its quantitative interpretation.

The emergence of the concept of the Laffer curve brought the research to a new level, since the assumption put forward by A. Laffer indicated the presence of such a level of aggregate taxation at which there would be a reduction in the official sector of the economy. It is possible to state the fact that the official sector of the economy has contracted using indicators of the official sector's performance; therefore, such conclusions are based on the assumption that there is a relationship between the tax burden and the performance indicators of the official sector (Stasyuk and Ryabtsev 2001)[1].

[1] Consultant Plus. Tax burden by type of economic activity, in percent. URL: http://www.consultant.ru/document/cons_doc_LAW_55729/c5bf610f4f4a5a6d1e04bf6a41ff3c849e831c2e/. Data accessed: 05 Nov 2020 (in Russ.).

The methodology presented for the first time for calculating the tax burden falls precisely on the 90s of the last century, author E. Egorova determined the indicator "full rate of value added taxation" and proposed a methodology. The existence of more than 50 methods for assessing the tax burden of an organization indicates that, despite the development of the methodological apparatus, a unified method for assessing the tax burden of an organization has not been developed.

It should be noted that the concept under consideration is based on the process of assessment and management. The author's definition of "tax burden" is as follows: it is a structured and organized model of principles, methods and techniques for assessing and managing the taxation economy in a company based on the country's tax legislation, adjusted for the priority areas of its economic development strategy.

2 Materials and Methods

The development of the methodological apparatus has led to a greater variety of approaches at the present stage. An updated systematization of the classification of methods for assessing the tax burden of a company is shown in Fig. 2.

It should be noted that in most scientific studies of assessing the tax burden, when building a model based on formulas, such an economic indicator as the efficiency of a company's profitability is used. But there are also scientific studies in which the authors put the dependence of the size of the tax burden or its assessment

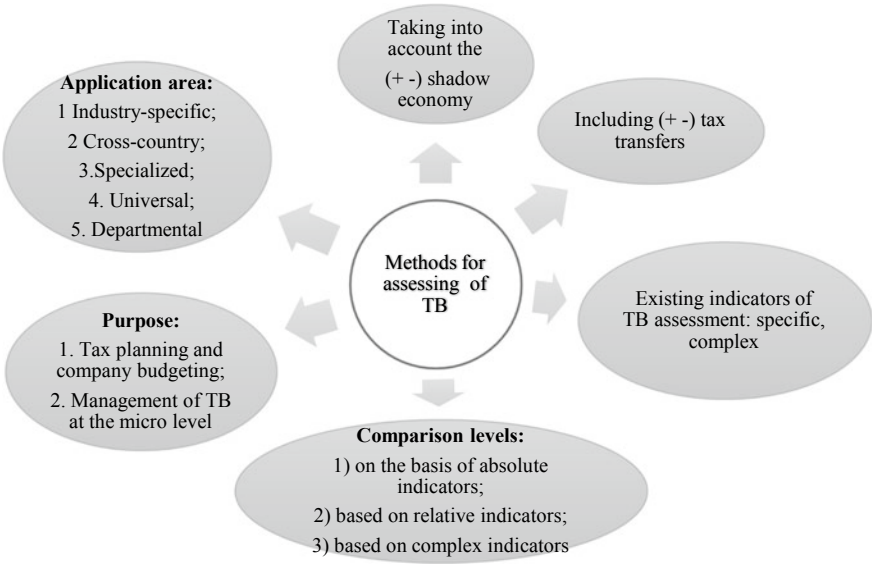

Fig. 2 Updated systematization of the classification of methods for assessing the tax burden (TB) of a company. *Source* Compiled by authors

with such economic indicators of the company's activities as capital intensity, material consumption, capital productivity, production or sales (Anisimov—Model of economic growth taking into account the tax factor (Anisimov 2013), B. Bukach—Model of the dynamics of accumulation of fixed capital depending on income tax, VAT and "social" tax (Bukach 2002).

However, studies of the 2000 tax reform in Russia showed that the tax burden does not affect the economic growth of the state. As noted in her work Sokolovskaya (2006), studies have not yet provided evidence of a relationship between economic growth and taxation levels. As the current economic situation in the country shows, it is very important to establish a relationship between the assessment of a company's taxation and the country's economic growth.

To establish the efficiency of the system for assessing and managing the tax burden, the interaction of the indicator of the tax burden and profitability is necessary. Let's consider this relationship in Figs. 3 and 4.

Analyzing the data in Fig. 3, there is a relationship between an increase in the return on assets and a directly proportional increase in the tax burden from 2013 to 2016, however, until 2017, the level of the tax burden is associated with a positive trend in the profitability of sales. This is due to the specifics of agricultural activities, seasonality, an increase in the growth of organizations and individual entrepreneurs who have switched to a single agricultural tax; the increase in revenues to the consolidated budget for this tax amounted to 3.3%, and the number of taxpayers increased over

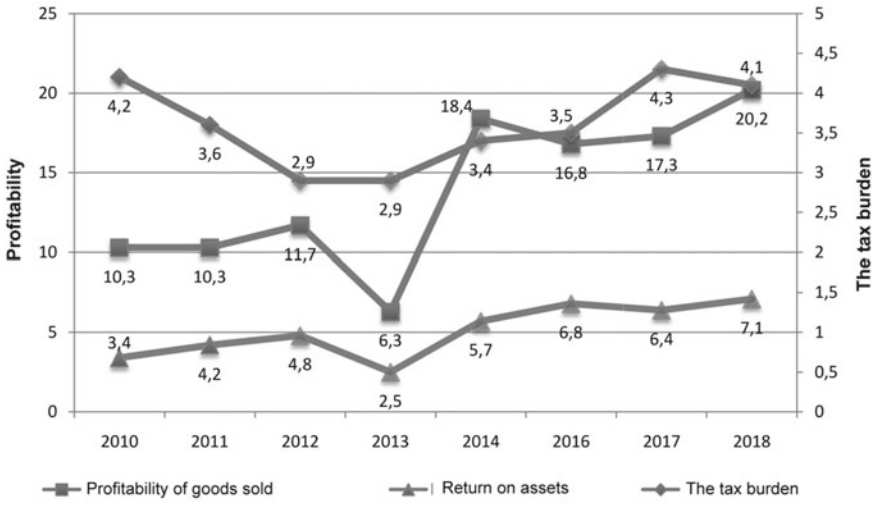

Fig. 3 Tax burden and profitability in agriculture for the period from 2010 to 2018, %. *Source* Compiled by authors

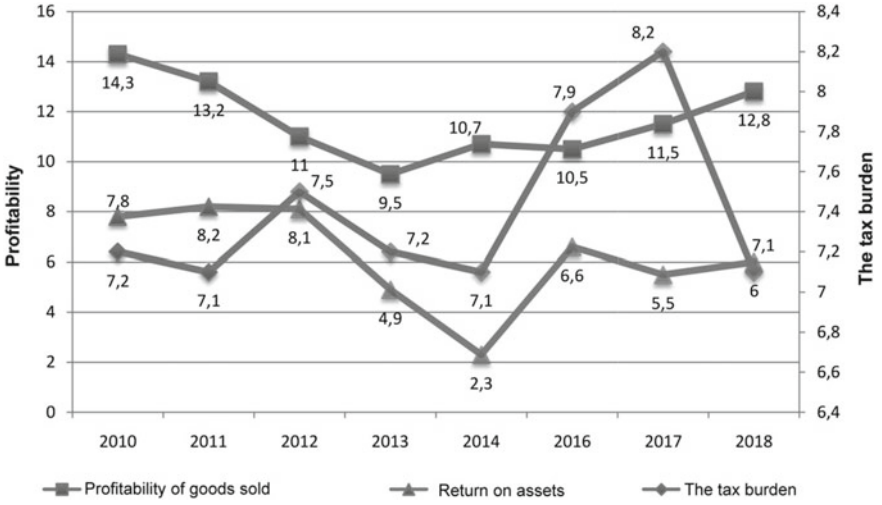

Fig. 4 Burden and profitability in manufacturing for the period from 2010 to 2018, in %. *Source* Compiled by authors

the period under review by 1.3 times from 1922 to 2566, in the context of individual entrepreneurs—by 398 payers, and organizations—by 1.7 times and organizations.[2]

The data shown in Fig. 4 for the manufacturing industry demonstrate the absence of dependence of the assessment of the tax burden of companies in the industry on the profitability of sales and assets.

Thus, considering examples in a number of sectors of the country's economy, we can conclude that there is no unambiguous interpretation of the interdependence and direct impact of the size of the tax burden on the positive or negative dynamics of both the return on assets of companies and the return on sales. In this issue, it is necessary to consider a whole range of indicators affecting the growth of sales of goods, works, services: taxable base, rates, price conditions on the market, introduction of ASK VAT-2 and a number of other points.

The problem of determining the optimality of the tax burden is debatable in modern taxation practice, most scientists agree that the optimal level is in the range of 30–40%. However, in foreign countries the level of tax burden is much higher; when compared with the EAEU countries, the tax burden is 16.5% higher (Fig. 5).

The tax burden of countries is influenced by both macroeconomic and microeconomic indicators. Comprehensive management and assessment of the tax burden of an economic entity shows how the level of taxation affects the economic activity of an enterprise and the country as a whole.

In turn, management should function harmoniously with analysis and planning. Tax planning in a business environment cannot be underestimated; it allows you

[2] Tax Code—15 years. URL: http://www.myshared.ru/slide/816133/. Data accessed: 05 Nov 2020 (in Russ.).

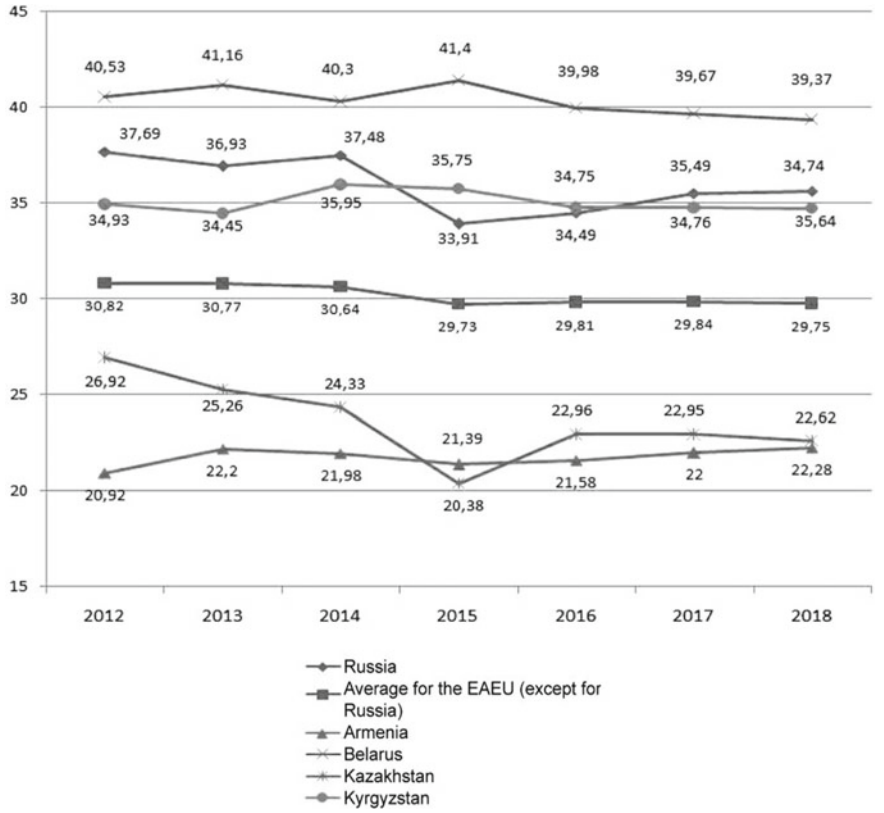

Fig. 5 Tax burden on the economy in the countries of the Eurasian Economic Union (in% of tax revenues to GDP). *Source* Compiled by authors

to competently approach the issue of managing and assessing the tax burden in an organization. Planning, analysis and evaluation of activities occurs at all stages of the life of an enterprise. After all, each element of the company's tax field is significant, for example, such as: organizational and legal form, tax regime, location, size of the company and the number of employees, etc. Figure 6 shows the stages, stages of processes for managing the tax burden.

3 Results

Summing up the above, it should be noted that the management and assessment of the tax burden is a systemonomic model in the structure of the tax system as a science of nalogonomy (Zhuravleva 2019), and according to the law of congruence it is based on fundamental philosophical principles, foundations and laws that underlie

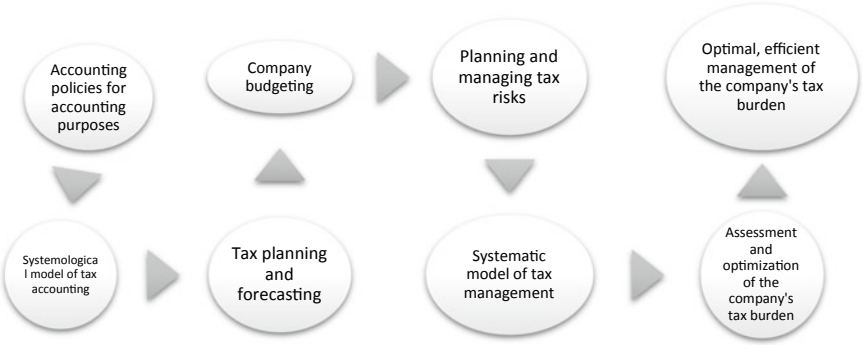

Fig. 6 Processes of managing the tax burden in the company. *Source* Compiled by authors

development of the Periodic System of Special Laws of Taxes (Zhuravleva 2019). At this stage of the development of economic processes in society and the improvement of tax relations towards the use of information technologies, there is a tendency for business activity in the search and use of the management potential and assessment of the company's tax burden on the basis of economic indicators of effective financial and economic activities, reducing tax risks and optimal tax planning.

Next, we will consider a mathematical multifactor model built on the basis of the main provisions and methodology of the systemonomic model of the AMTBC.

It should be noted that, according to J. King, indirect taxes, in particular VAT, should not be taken into account in the tax burden; they are not entirely correct, since payments of this type directly affect the consumption and sale of products, on the development of the economy as a whole and the fact of payment of the tax, depends on the elasticity of demand: when a tax of 20% of the price is introduced, the manufacturer does not raise the price by 20%, since the purchasing power will decrease (by virtue of the law demand). This fact is also the basis for the Laffer curve, which, using linear equations of supply and demand in the market, shows how, taking into account the introduction of a per-product tax (indirect taxation or turnover tax), the equilibrium volume of sales and, accordingly, the amount and volume of tax payments change. In this case, the number of organizations that have gone into the shadows on the sales market is not taken into account. It is obvious that an increase in the price of a product affects consumer behavior in the economic market and, as a result, the size of the organization's working capital, sales and tax revenues.

A regression model that takes into account the presented factors allows us to really assess the influence of the elements of the AMTBC systemonomic model on the tax burden. In addition, the proposed mathematical model can answer the question of why, given a significant tax burden in developed countries and a relatively low tax burden in Russia, companies focus on difficult tax conditions. The independent (explanatory) values in the model are designated as X, while the explained, dependent value is Y. For example, an increase in consumption arises from the aggregate increase in income. The demand for any good decreases with an increase in its

price. Investment rises when the bank interest rate drops. Regression analysis solves problems so that by analyzing the results of observations, i.e. a sample of limited size to obtain the best point estimates of the parameters β_0 and β_1; check statistical hypotheses about the parameters of the model and the adequacy of the model to the results of observations; as well as explain the results obtained and give a predictive value of the explained variable.

The model will show the presence and absence of a relationship between the tax burden of an organization and indicators of the efficiency of economic activity, which must be used in the development of approaches and tools for tax planning and regulation. Knowing that there is a connection between the tax burden of organizations and performance indicators and other important factors, elements of the AMTBC systemonomic model, it is advisable to develop measures to optimize the tax burden of organizations within a certain range with a preliminary assessment of the current level of tax burden, tax risks and tax management, tax policy ensuring a given level of efficiency of economic activity.

The multiple regression model in general looks like this (formula 1):

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + ... + \varepsilon, \quad (1)$$

where y_i is the dependent variable (Tax burden of the organization) $x_{1i}, x_{2i}, \ldots, -$ independent variables influencing the performance indicator;

$\beta_0, \ldots, \beta_i$—the estimates of the coefficients.

For the analysis, it is advisable to select several dependent variables in accordance with the systemonomic model of management and assessment of the company's tax burden. Let's divide them into groups:

1. Criteria and indicators of the company's economic activity:
   x_1—the median return on equity;
   x_2—capital investments,% of GDP (the main impact of taxation on the activities of organizations is the rise in the cost of investments in fixed assets, research and development, while the amortization charged subsequently reduces tax payments);
   x_3—depreciation charges, million rubles;
2. Elements of economic composites of the company:
   x_4—arrears to the budget for local taxes and fees (million rubles);
   x_5—turnover of current assets, days;
   x_6—accounts payable, billion rubles;
3. Elements of taxes paid:
   x_7—the size of various elements (excise taxes, VAT, insurance premiums, income tax, mineral extraction tax, personal income tax);
   x_8—rates for VAT, income tax, insurance premiums;
4. Influencing factors (internal and external) at the macro and micro levels:
   x_9—significant changes, pcs. (counted as the number of chapters changed);
   x_{10}—the difference between the tax burden in the current period and the burden in the previous period, pp;

x_{11}—the coefficient of variation, %;
x_{12}—public administration efficiency index (the actual burden may be lower if the state effectively uses the collected funds to provide public, tax preferences, tax deductions, deferrals and deferrals for payment of tax and other economic and financial benefits);
x_{13}—dollar rate, rub.;
x_{14}—inflation,%;

5. Analysis and management of tax risks, systemonomic models: tax accounting, AMTBC and tax management.
Business activities are always associated with numerous transactions that are subject to financial risks, including tax risks. Earlier, we noted that tax risks have a significant weight in the management of a company's finances and its tax burden, since they are one of the important factors that determine the efficiency of a company's functioning. Optimal and effective decisions in the field of taxation are needed not only to maximize financial results, but also to minimize risks, search for tax potential in the company.
x_{15}—fines;
x_{16}—% of employed in public administration and military security.

Due to the fact that the analyzed period is not very long, it is necessary to select the minimum of coefficients in each group (Table 1). For this we will build a correlation matrix. To obtain the most statistically significant regression model, we will select the factors that have the closest relationship with the resulting indicator y (provided that the factors x themselves are practically independent).

It can be noted that arrears in payments to the budget are decreasing every year, despite the growth in production and an increase in absolute terms of tax payments, which indicates a tightening of tax policy (Table 2).

The following indicators are considered as the dependent variable y:

y_1—tax burden calculated as the ratio of the volume of paid taxes to the turnover of the enterprise;
y_2—tax burden,% of GDP.
y_3—the ratio of the volume of all taxes paid to the budgets to the total revenue of all companies.
y_4—the ratio of the volume of all taxes paid, excluding personal income tax, to total revenue (since personal income tax is deducted from the accrued salary and the worker pays it).

It can be seen that in almost every case (for each x), the relationship is stronger than the y-dependent variable y_1 (tax burden as the ratio of taxes to turnover). Therefore, this variable will be considered in the analysis.

Accordingly, we select factors from each group with a correlation coefficient above 0.7–0.8 in modulus (or the largest coefficient in the group). The calculated regression equation makes it possible to predict how the value of the dependent variable will change. Suppose, for example, that in the next (2020) year the variables *Income Tax*, *Substantial Changes*, *Coefficient of Variation*, and *Administrative*

Table 1 Selection

Factors	Year	2006	2007	//-	2017	2018	2019
y_1	Tax burden, T/Turnover[a]	11.6	14.4	//-	10.8	11	11
y_2	Tax burden,% of GDP	36	40	//-	34	36	39
y_3	T/Revenue	9.05%	9.30%	//-	6.80%	8.36%	8.91%
y_4	(T-personal income tax)/Revenue	7.50%	7.61%	//-	5.52%	6.93%	7.36%
x_1	ROE (median across all companies)[b]	21.0	19.0	//-	36.0	33.1	31.0
x_2	Capital investments, % of GDP	21.17	24.16	//-	23.61	21.98	23.11
x_3	Shock absorber. deductions (mln rubles)[c]	1270	1542	//-	6300	7010	7349
x_4	Debt to the budget for local taxes and fees (million rubles)[d]	31,351	28,433	//-	87,743	79,712	75,201
x_5	Turnover vol. assets (days)[e]	139	140	//-	127	131	137
x_6	Accounts payable to suppliers, RUB bln	3949	5500	//-	20,654	23,570	25,028
x_6	Overdue payables to suppliers	475	554	//-	1961	2386	2598.5
x_6	Accounts payable on payments to the budget, billion rubles	544	686	//-	2182	2616	2833
x_6	Overdue payables on payments to the budget	133	103	//-	63	59	57
x_6	Accounts payable to off-budget funds, billion rubles	151	129	//-	345	363	372
x_6	Overdue payables, RUB bln	77	52	//-	51	54	55.5
x_7	Excise taxes, RUB billion	253.3	289.9	//-	1521.3	1493.2	1277.5
x_7	VAT, RUB billion	924.2	1390.4	//-	3069.9	3574.6	4257.8
x_7	Oil production tax, RUB billion	1038.4	1070.9	//-	3352.2	5232.3	5175.5
x_7	MET, billion rubles	1162.3	1197.4	//-	4130.4	6127.4	6106.4
x_7	Personal income tax, billion rubles	929.9	1266.1	//-	3251.1	3653.0	3955.2
x_7	Income tax of organizations, billion rubles	1670.5	2172.2	//-	3290.0	4100.0	45,431
x_8	INCOME TAX, %	24	24	//-	20	20	20
x_8	VAT, %	18	18	//-	18	18	20
x_8	Insurance premiums, %	26	26	//-	30	30	30
x_9	Significant changes, pcs	27	22	//-	35	29	29

(continued)

Penalties (those that are independent of the organization) remain at the 2019 level.[3] Amortization deductions = 7.5 billion rubles, the turnover rate will be reduced to 120 days.

[3] Tax burden by type of economic activity in 2019. URL: https://www.sba-consult.ru/nalogovaja-nagruzka-po-vidam-jekonomicheskoj-dejatelnosti-v-2019-godu/. (in Russ.) (Data accessed: 05.11.20).

Table 1 (continued)

Factors	Year	2006	2007	//-	2017	2018	2019
x_{10}	Difference, p.p	0.0	2.8	//-	1.2	0.2	0.0
x_{11}	The coefficient of variation, %	0.0%	152%	//-	15.7%	15.0%	14.4%
x_{12}	Public administration efficiency index[b])	-0.44	-0.39	//-	-0.08	-0.06	0.15
x_{13}	Dollar rate, rubles	26.33	24.54	//-	57.6	69.47	61.9
x_{14}	Inflation, %	9	11.87	//-	2.52	4.27	3.05
x_{15}	Administrative fines, billion rubles[b])	8.3	15.0	//-	79.7	173.4	244.0
x_{16}	Employed in public administration, %[f]	5.2	5.4	//-	5.2	5.1	5.1

Source Compiled by the authors based on government statistics
[a]Return on equity by industry (type of activity). URL: https://www.testfirm.ru/finfactor/roe/. Data accessed: 05 Nov 2020 (in Russ.), [b]Russia Government effectiveness. URL: https://www.theglobaleconomy.com/Russia/wb_government_effectiveness/. Data accessed: 05 Nov 2020, [c]Depreciation of fixed assets accrued for the reporting year in commercial organizations. URL: https://rosstat.gov.ru/free_doc/new_site/business/osnfond/amort_11_ved.htm. Data accessed: 05 Nov 2020 (in Russ.), [d]Debt on taxes and fees, penalties and tax sanctions to the budgetary system of the Russian Federation. URL: https://www.fedstat.ru/indicator/42549. Data accessed: 05 Nov 2020 (in Russ.), [e]Turnover of current assets, in days by industry (type of activity). URL: https://www.testfirm.ru/finfactor/cassetturnover/. Data accessed: 05 Nov 2020 (in Russ.), [f]Labor resources. URL: http://old.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/wages/labour_force. Data accessed 05 Nov 2020 (in Russ.)

Table 2 Correlation matrix

	y1	y2	y3	y4	x1	x2	x3	x4	x5	x6	x6	x6	x6	x6	x6	x7	x7
y1	1.0	0.8	0.7	0.7	−0.5	0.1	−0.5	−0.3	0.6	−0.5	−0.3	−0.4	0.5	−0.4	0.2	−0.5	−0.3
y2		1.0	0.9	0.9	−0.4	0.3	−0.3	−0.2	0.5	−0.3	−0.1	−0.2	0.4	−0.3	0.2	−0.4	−0.1
y3			1.0	1.0	−0.6	0.2	−0.4	−0.4	0.6	−0.4	−0.3	−0.3	0.6	−0.4	0.3	−0.5	−0.2
y4				1.0	−0.4	0.2	−0.3	−0.2	0.5	−0.3	−0.1	−0.2	0.5	−0.3	0.5	−0.4	0.0

	x7	x7	x7	x7	x8	x8	x8	x9	x10	x11	x12	x13	x14	x15	x16
y1	−0.2	−0.3	−0.4	−0.1	0.8	0.0	−0.6	−0.7	−0.2	−0.9	−0.1	−0.4	0.4	−0.6	−0.1
y2	0.0	0.0	-0.2	0.2	0.7	0.4	−0.5	−0.8	0.1	−0.7	0.1	−0.3	0.2	−0.4	−0.2
y3	0.0	−0.1	−0.4	0.1	0.7	0.3	−0.4	−0.7	0.3	−0.7	−0.1	−0.4	0.2	−0.5	−0.2
y4	0.1	0.1	−0.3	0.2	0.7	0.4	−0.3	−0.7	0.4	−0.7	0.0	−0.3	0.1	−0.5	−0.4

Source Calculated by the authors according to Table 1

The predicted value of y lies in the interval (2):

$$y_0 - t_{crit} \cdot S_{y_0^*} \leq y_{20} \leq y_0 + t_{crit} \cdot S_{y_0^*} \tag{2}$$

$$S_{y_0^*} = \sqrt{\frac{\sum_{i=1}^{n} e^2}{n-m-1}} \cdot \sqrt{1 + X_0^T \cdot \left(X^T \cdot X\right)^{-1} \cdot X_0} = 0.4268 \cdot \sqrt{1 + 1.2644} = 0.5396$$

$$t_{crit} = t_{\alpha;n-m-1} = 2.4469$$

$$y_0 = \hat{y}_{20} = \hat{y}(X_0) = 10.25$$

Thus, we get the interval: $8.931\% \leq y_{20} \leq 11.572\%$. Or about 10.251%, i.e. lower by 0.75 p.p.

4 Discussion

Calculations lead to the following conclusions:

If depreciation charges change by 1%, the tax burden increases by 51.6%. A controversial conclusion, the opposite effect is possible—with an increase in the tax burden, organizations tend to overestimate the depreciation deductions.

With an increase in the duration of the turnover of current assets by 1%, the tax burden grows on average by 72.3%. It is vitally important for an enterprise to shorten the period of turnover of assets; this is due to the fact that tax deferrals permitted by legislation allow accelerating the receipt of the company's profit (the intensity of the funds being turned over). This is true in any conditions.

With a decrease in income tax deductions by 1%, the tax burden grows; perhaps this is relevant only for the sample under consideration, since due to the stimulation of the transition to special taxation regimes and the emergence of a large number of individual entrepreneurs, income tax revenues of organizations decreased. While the burden on the economy increased.

If the state makes amendments to the tax legislation, then it reduces (on average) the tax burden. Moreover, it balances between the stability of tax revenues, the economy, and the load as it should be. This is due to the fact that when making decisions at the enterprise and investors, they compare the possible income and risks. As the risk increases, (in this case, the variability of tax policy), the profitability should increase (or the burden should decrease). This is important for the growth of investment and economic development.

Tax burden management and assessment is based on many constituent elements. The history of the development of the tax burden and its management shows that tax collection should be based not only on the receipt of income, but also should serve as a source of development for the state. Public authorities must create fair taxation in accordance with statutory principles.

5 Conclusion

Our goal of disclosing the elements of the AMTBC systemonomic model on the basis of scientific philosophical principles showing a universal approach to the systemonomic, basic analysis of the study of the AMTBC science in the company has been achieved and confirmed by the data of the mathematical model of regression analysis. The proposed systemonomic model of AMTBC is universal, multifactorial and allows, in the interconnection of the model elements, to identify companies both their strengths, potential effective sides of assessing and managing the tax burden, and to determine the possible tax risks at the stage of tax planning and forecasting.

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Economic Security in International Cooperation: Risk Overview and Risk Management Perspectives

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Abstract This study aims to assess the risks that international cooperation poses to economic security. Moreover, we intend to outline the perspectives of risk management in international cooperation. For this purpose, we analyzed the flexibility and the scale of cooperation using the correlation analysis method. The results demonstrated that international cooperation causes fewer risks to economic security than is presumed. Moreover, cooperation can help fight the risks that other factors (not pertaining to cooperation) induce. Therefore, we recommend expanding international cooperation in the countries that aim to reduce overall business risks, cybersecurity risks, and unemployment risks. Nevertheless, we established that there is a universal risk of international integration, connected with increased import-dependence of national economies. This risk cannot be fully mitigated by increasing the flexibility of international cooperation. However, limiting the scale of cooperation to only include digital knowledge sharing allowed decreasing the risk from 41.84 to 37.30%, as well as other risks of economic security. We recommend modern enterprises to expand international cooperation and digital knowledge sharing in the fields of manufacturing, management, and human resources.

Keywords Economic security · International cooperation · Strategic alliances · Digital knowledge sharing · Technology · Risks · Risk management

JEL Codes C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

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1 Introduction

International cooperation is a way of dividing labor and combining efforts and resources at the level of enterprises that leads to better business efficiency. The modern economic environment, created by several decades of globalization, is extremely favorable to international cooperation and international trade. The principal difference between international cooperation and international is competition: cooperation compels enterprises to engage in similar or joint activities, benefiting from a more efficient organization of the business.

Compared to cross-border mergers and acquisitions, international cooperation does not lead to monopolization of markets but maintains or even strengthens the competitive environment. This explains the strong influence of international cooperation on entrepreneurship and the speed of economic growth. International cooperation is especially important during crises (e.g., COVID-19 pandemic), when enterprises desperately need it due to the lower efficiency of business processes.

In this study, we set forth the following working hypothesis, "International cooperation brings certain risks for economic security that can be mitigated by limiting the scale of cooperation to only knowledge sharing." The digital economic conditions allowed fragmentary (small-scale) international cooperation to flourish—there is no need to overcome the geographical gap between enterprises. In this case, the benefits of international cooperation are more apparent due to its lack of pronounced influence on competition.

In this study, we seek to outline the risks that international cooperation poses to economic security and identify its risk management prospects through increased flexibility of cooperation.

2 Literature Review

Economic security issues are a subject of numerous scholarly studies (Bogoviz et al. 2019a, b, 2020a, b, c; Popkova et al. 2015a, b; Zorin et al. 2016), some of which outline their dire state in the current conditions of the COVID-19 crisis.

International cooperation and its specific features and development trends were studied in the works of several foreign scholars (Agyabeng-Mensah et al. 2020; Bintoro et al. 2020; Casalegno et al. 2020; Fokdal et al. 2020). However, the risks that international cooperation poses to economic security, as well as the prospects for its risk management, are poorly understood and vaguely defined. This research gap is addressed in this article.

3 Materials and Methods

To assess the impact of international cooperation on economic security, we applied the correlation analysis method to define the dependence of the following indices of economic security on strategic alliance deals (large-scale cooperation) (WIPO 2020) and knowledge sharing (small-scale cooperation) (IMD 2020):

- Entrepreneurial fear of failure (IMD 2020): negative correlation would mean that entrepreneurial risks increase together with the expansion of international cooperation;
- Cybersecurity (IMD 2020): negative correlation would mean that cybersecurity risks increase together with the expansion of international cooperation;
- Unemployment (International Monetary Fund 2020): negative correlation would mean that unemployment risks increase together with the expansion of international cooperation;
- Imports of goods and services (World Economic Forum 2019): negative correlation would mean that import-dependence risks increase together with the expansion of international cooperation.

We will assume that the hypothesis is correct if the following two statements are correct:

- There is an established negative correlation of large-scale international cooperation with at least one of the indices of economic security;
- The positive or negative correlation of small-scale cooperation is closer to zero, compared to large-scale cooperation.

Since statistics on international cooperation are not available for a wide range of countries, we rely on general statistics on enterprise cooperation. However, we will study these statistics on the example of the most globalized countries, according to KOF data (KOF 2020), which will increase the accuracy and reliability of the information on international cooperation. Empirical data for the research are presented in Table 1.

4 Results

To test the hypothesis and determine the effects of international cooperation on the economic security indices, we will apply the method of correlation analysis to the data from Table 1 (Fig. 1).

According to Fig. 1, international cooperation does cause additional risks to economic security. Instead, it allows to decrease the risks to business security, cybersecurity, and employment. Small-scale cooperation mitigates these risks much more efficiently (correlation of 47.66%, 96.19% and 43.63%, respectively) than large-scale cooperation (correlation of 13.79%, 85.61% and 9.22%, respectively).

Table 1 International cooperation and economic security indices in sampled countries in 2020

Country	Cooperation scale		Economic security indices			
	JV-strategic alliance deals, ranking	Knowledge sharing	Entrepreneurial fear of failure	Cybersecurity	Unemployment rate, % of the total labor force	Imports, % GDP
Belgium	29	17	46	30	6.136	108.6
Chile	72	51	52	49	11.441	29.5
United Kingdom	16	18	34	27	5.375	361.9
Mexico	100	48	44	59	5.238	42.0
Netherlands	23	2	3	18	5.500	95.8
Peru	114	56	7	55	12.473	23.5
Russia	60	58	37	48	5.600	21.0
South Africa	40	52	47	54	36.989	35.3
Sweden	3	5	30	19	8.669	54.3
Switzerland	13	1	2	10	3.211	43.3

Source Compiled by the authors based on the IMD, IMF, WIPO, and WEF data(IMD 2020; International Monetary Fund 2020; WIPO 2020; World Economic Forum 2019)

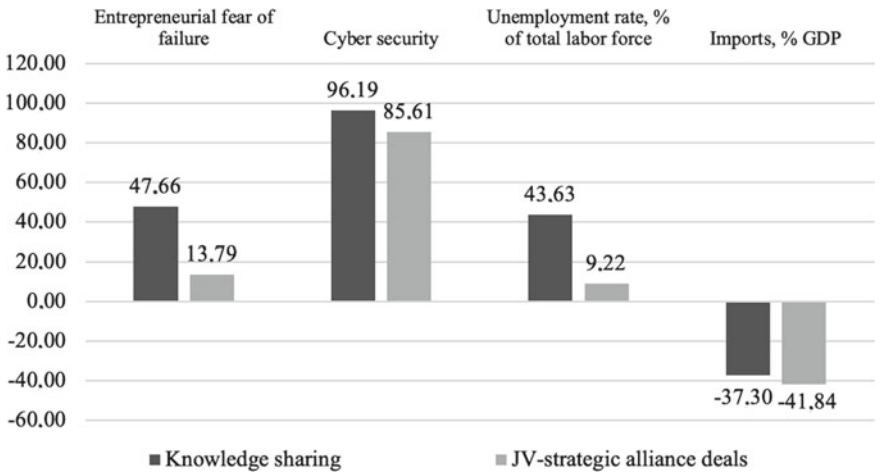

Fig. 1 Correlation of small-scale and large-scale international cooperation and economic security indices. *Source* Compiled by the authors

Nevertheless, international cooperation increases the import-dependence of national economies. This risk cannot be managed by changing the scale of international scale. However, small-scale cooperation causes less import-dependence (correlation of −37.30%) than large-scale cooperation (correlation of −41.84%).

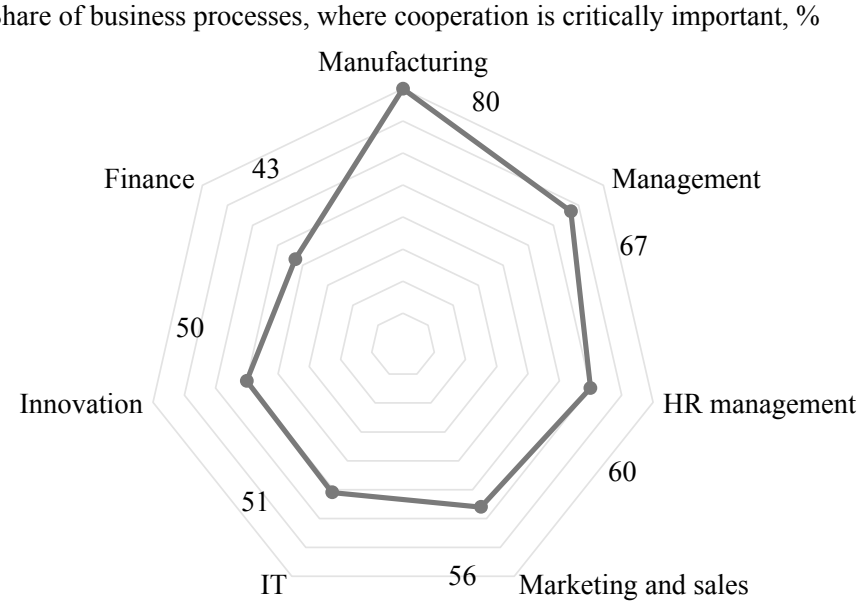

Fig. 2 Share of business processes, in which knowledge sharing is critically important, %. *Source* Compiled by the authors based on the Forbes data Columbus (2020)

The correlation analysis results proved the working hypothesis and demonstrated that modern enterprises need to shift their focus to small-scale cooperation (knowledge sharing).

To determine the priority areas of expanding small-scale cooperation, we will analyze Forbes data (Columbus 2020) that reflect the share of business process in which knowledge sharing is critically important (Fig. 2).

Figure 2 demonstrates that knowledge sharing is essential for 80% of manufacturing processes, 67% management processes, and 60% HR management processes. Therefore, we recommend expanding digital, small-scale cooperation in these three directions to more efficiently manage risks to economic security.

5 Conclusion

We proved the working hypothesis, but some of the results were unexpected—they deserve special attention. We established that international cooperation does not cause most risks to economic security and, furthermore, allows mitigating other risks (caused by reasons unrelated to international cooperation). For these reasons, we recommend expanding international cooperation in the countries that aim to reduce overall business risks, cybersecurity risks, and unemployment risks.

However, we established that international cooperation increases the import-dependence of national economies. Even though this risk cannot be fully mitigated by increasing flexibility of international cooperation, limiting its scale to knowledge sharing would reduce this risk from 41.84 to 37.30%, while achieving a more significant reduction of other risks.

We recommend enterprises to expand small-scale international cooperation (knowledge sharing) in the fields of manufacturing, management, and HR management. International cooperation in these fields deserves further, additional studies.

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Management Projects in the Cooperative Sector of the Economy: Current Problems and Prospects for Their Solution

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Abstract The paper aims to form a systematic view of management projects in the cooperative sector of the economy, considering the factors of their state regulation and their implications for stakeholders to identify current problems and the prospects for their solutions comprehensively. The authors formed a sample of the developed (G7) and developing countries (BRICS). To identify the current challenges and benefits of implementing management projects in the cooperative sector of the economy using the method of correlation and regression analysis, the authors determined the relationship of clustering projects, co-investment, and cooperation of employees and employers with the social consequences and potential factors of state regulation in 2020. As a result, the authors identified the current problems of project implementation in the cooperative sector of the economy. These problems are as follows: insufficient future regulatory orientation (the average correlation with future regulatory orientation—59.4%, the average score in 2020—65.49 points), insufficient liberalization of the economy (the average correlation with economic liberalization—42.40%, the average value of the indicator in 2020—61.41 points), and the negative impact of regulatory transparency (the average correlation with regulatory transparency is −1.20%, the average value of the indicator in 2020—66.42 points). The authors proposed recommendations to address these problems, which suggest a 27.10% increase in the future orientation of regulation to 83.24 points and a 22.90% increase in the liberality of the economy to 75.47 points.

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Keywords Management projects · Cooperative sector · Current problems · Solution prospects · Developed countries · Developing countries

JEL Codes C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

1 Introduction

The cooperative sector of the economy can take various forms. Depending on the form taken, the development patterns of the cooperative sector of the economy are highly differentiated. Cooperation in the form of mergers and acquisitions leading to the monopolization of markets makes them less dependent on government regulation and more resilient to changes in the business environment. In this case, there may occur negative consequences in the form of reduced efficiency of human resource management and incomplete disclosure of human potential.

Cooperation in the form of limited cooperation of independent and competing business structures, on the contrary, preserves their high dependence on state regulation factors but allows to generate benefits for the economy in the form of improved practices of human resource management and improved quality of life. Consequently, the problems of cooperation encompass its adverse effects on the economy and the unfavorable business environment for cooperation development.

The problem is that the differences between these forms of cooperation are poorly studied. The patterns of implementation of management projects in the cooperative sector of the economy are studied fragmentarily—only from the perspective of state regulation factors or only from the perspective of the consequences for stakeholders. As a result, the cause-and-effect relationships of implementing management projects in the cooperative sector of the economy are not clear, which prevents a reliable interpretation of the essence of these projects and their regulation.

In practice, there exist both the risks of insufficient development of cooperation demanded in the economy due to an unfavorable business climate and the risks of the negative impact of cooperation on the economy not restrained by regulatory measures. This paper aims to form a systematic view of management projects in the cooperative sector of the economy, taking into account the factors of their state regulation and their implications for stakeholders for comprehensive identification of urgent problems and the prospects for their solutions.

2 Literature Review

Many research study management projects in the cooperative sector of the economy (Casalegno et al. 2020; Franco and Haase 2020; Ouyang et al. 2020). The influence of state regulation factors on the management of entrepreneurial structures has been studied in the works (Bogoviz 2020; Bogoviz et al. 2020; Popkova 2020a). The

implications of business cooperation for society and the economy are revealed in the publications (Arefev et al. 2019; Kosolapova 2019; Popkova 2020b; Sillaste 2019).

Nevertheless, despite the high degree of elaboration of the identified issues separately, there is no systematic view of management projects in the cooperative sector of the economy, taking into account the factors of their state regulation and their implications for stakeholders. This paper aims to fill this gap.

3 Materials and Methods

The authors formed a sample of the developed (G7) and developing countries (BRICS). To identify the current challenges and benefits of implementing management projects in the cooperative sector of the economy using the method of correlation and regression analysis, the authors determined the relationship of clustering projects, co-investment, and cooperation of employees and employers with the social consequences (Table 1) and potential factors of state regulation in 2020 (Table 2).

4 Results

The results of the correlation analysis of the relationship of management projects in the cooperative sector of the economy with the factors of state regulation and social consequences (based on the data from Tables 1, 2) are shown in Table 1.

According to Table 3, the advantages of implementing management projects in the cooperative sector of the economy are as follows:

- Contribution to poverty reduction (the average correlation with the poverty gap at $3.20 a day: −58.30%);
- Contribution to reducing social inequality in the economy (the average correlation with the coefficient of human inequality: −65.32%);
- Contribution to labor productivity growth (the average correlation with labor productivity per capita: 66.31%);
- Contribution to human development (the average correlation with human potential: 71.39%).

Current problems in the implementation of projects in the cooperative sector of the economy are as follows:

- Insufficient future regulatory orientation (the average correlation with future regulatory orientation—59.4%; the average score in 2020—65.49 points);
- Insufficient liberalization of the economy (the average correlation with economic liberalization—42.40%; the average value of the indicator in 2020—61.41 points);

Table.1 Management projects in the cooperative sector of the economy and their social implications in 2020

Country		Management projects in the cooperative sector of the economy, points 1–100			Social consequences of the implementation of management projects in the cooperative sector of the economy			
		Clustering projects (state of the cluster development, 12.02)	Joint investment projects (international co-inventions, 12.03)	Projects of cooperation in labor-employer relations (8.03)	Poverty gap at $3.20 a day, % of the population (the less, the better)	Coefficient of inequality of people, % (the less, the better)	Labor productivity per capita, $ per hour	Human potential, points 1–100
		x_1	x_2	x_3	y_1	y_2	y_3	y_4
G7	Germany	73.5	95.4	66.8	0.24	8.1	66.42	67.60
	Italy	76.9	51.7	49.4	1.78	11.8	53.28	52.70
	Canada	63.8	85.2	67.5	0.52	8.5	52.17	66.20
	UK	65.9	79.8	66.1	0.21	8.0	58.39	64.60
	USA	74.8	79.6	70.6	0.73	12.8	70.78	71.70
	France	62.1	77.4	54.1	0.30	9.1	67.66	60.80
	Japan	67.7	55.5	79.9	0.68	3.6	45.90	61.70
BRICS	Brazil	48.7	8.2	44.1	11.19	23.8	N/A	39.40
	India	54.3	10.1	58.4	27.38	16.8	N/A	52.90
	South Africa	36.4	55.47	8.4	34.25	31.4	20.82	46.10
	China	59.6	19.7	59.6	2.51	15.6	N/A	59.40
	Russia	40.3	15.9	56.5	0.05	9.6	25.68	54.80

Source Compiled by the authors (Institute of Scientific Communications, 2020; World Economic Forum 2019)
Note N/A—data is missing; the economic analysis using automation tools will assign zero values to these cells to fill gaps in the data set

Table.2 Potential factors of state regulation of management projects in the cooperative sector of the economy in 2020

Country		Future regulatory orientation, points 1–100	Liberal economy, points 1–100	Transparency of regulation, points 1–100
		f_1	f_2	f_3
G7	Germany	79.0	71.2	69
	Italy	57.1	55.6	73
	Canada	69.1	72.2	71
	UK	74.5	70.1	74
	USA	68.2	72.0	77
	France	71.0	68.2	74
	Japan	69.2	68.7	60
BRICS	Brazil	49.1	51.9	77
	India	69.7	51.9	48
	South Africa	59.0	70.7	89
	China	65.3	36.0	13
	Russia	54.7	48.4	72

Source Compiled by the authors based on (Institute of Scientific Communications, 2020)

- The negative impact of regulatory transparency (the average correlation with regulatory transparency is −1.20%; the average value of the indicator in 2020—66.42 points).

In order to clarify the identified correlation relationships, they were supplemented by regression analysis. The results of the conducted regression analysis are shown in Tables 4 and 5.

Based on the results of the regression analysis from Tables 4 and 5, the authors determined the prospects (Fig. 1) and recommendations (Fig. 2) for solving urgent problems of implementing management projects in the corporate sector of the economy.

According to Figs. 1 and 2, to solve the current problems of implementing management projects in the corporate sector of the economy, it is necessary to:

- Increase future regulatory orientation by 27.10% to 83.24 points;
- Increase liberal economy by 22.90% to 75.47 points.

Due to this activity, the implementation of clustering projects will increase to 74.61 points (+23.67%), co-investment projects—to 100 points (+89.28%), and projects of cooperation between employees and employers—to 75.07 points (+32.20%). This will reduce the poverty gap at $3.20 a day to zero (−173.26%), the human inequality rate—to 4.30% (−67.58%). Moreover, this will increase productivity to $77.97 per hour per capita (+102.92%) and human capacity to 71.72 points (+23.32%).

Table.3 Correlation of management projects in the cooperative sector of the economy with the factors of state regulation and social consequences

Correlation, %	Social consequences of the implementation of management projects in the cooperative sector of the economy				Terms of state regulation of the economy and business		
Management projects in the cooperative sector of the economy	Poverty gap at $3.20 a day	Coefficient of inequality of people	Labor productivity per capita	Human potential	Future Regulatory Orientation	The degree of the liberality of the economy	Transparency of regulation
Clustering projects	−62.52	−65.01	68.11	68.53	56.40	32.06	−10.80
Co-investment projects	−38.79	−43.00	90.62	72.72	68.36	85.91	41.56
Projects of cooperation between employees and employers	−73.58	−87.95	40.20	72.94	55.05	9.21	−34.36
Average correlation	−58.30	−65.32	66.31	71.39	59.94	42.40	−1.20

Source Compiled by the authors

Table.4 Regression dependence of management projects in the cooperative sector of the economy on state regulation factors

Regression statistics	x_1	x_2	x_3
Multiple correlation (r^2), %	57.62	90.60	60.50
Constant	16.85	−138.98	7.94
Coefficient at f_1	0.51	1.23	0.93
Coefficient at f_2	0.37	1.80	0.13
Coefficient at f_3	−0.19	0.01	−0.30

Source Compiled by the authors

Table.5 Regression dependence of social consequences on management projects in the cooperative sector of the economy

Regression statistics	y_1	y_2	y_3	y_4
Multiple correlation (r^2), %	76.60	90.41	92.61	91.84
Constant	38.89	34.68	−25.03	34.63
Coefficient at x_1	−0.11	0.05	0.32	−0.08
Coefficient at x_2	−0.06	−0.06	0.69	0.18
Coefficient at x_3	−0.40	−0.37	0.14	0.33

Source Compiled by the authors

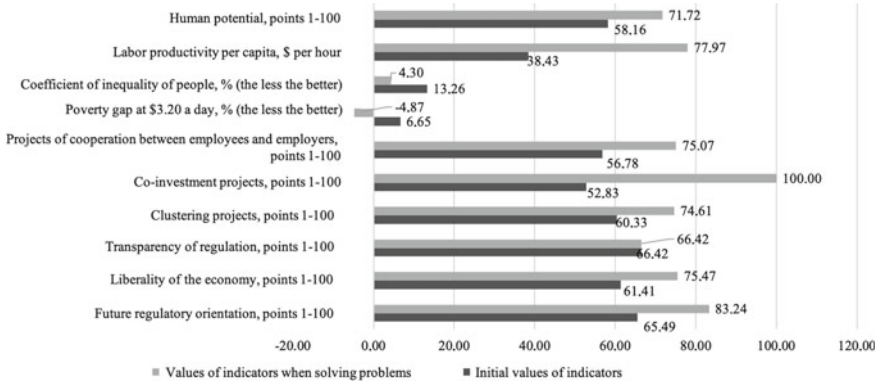

Fig. 1 Prospects for solving current problems of implementation of management projects in the corporate sector of the economy. *Source* Compiled by the authors

5 Conclusion

As a result of the study, the authors identified the current problems of implementing projects in the cooperative sector of the economy. These problems include insufficient future orientation of regulation (the average correlation with future orientation of regulation—59.4%, the average value of the indicator in 2020—65.49 points),

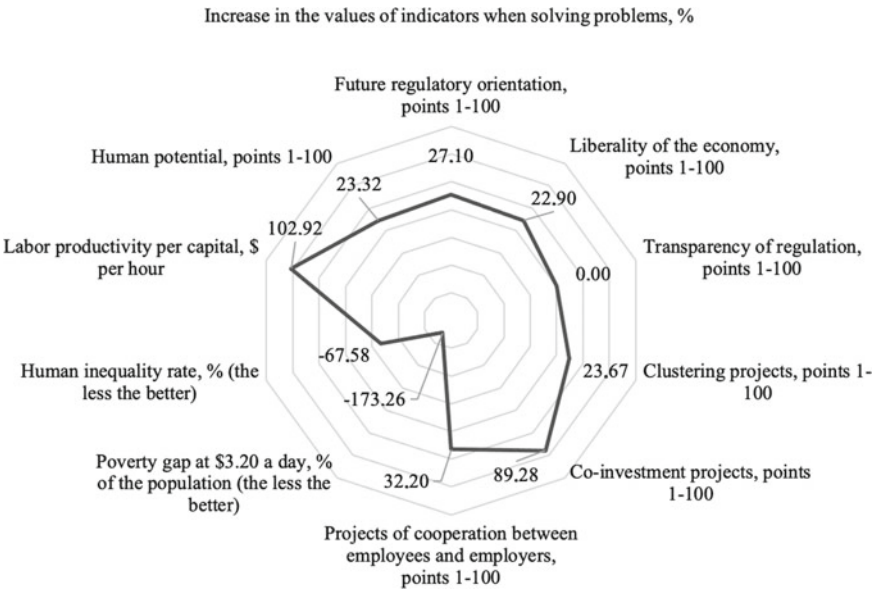

Fig. 2 Recommendations for solving current problems of implementation of management projects in the corporate sector of the economy. *Source* Compiled by the authors

insufficient liberalization of the economy (the average correlation with the liberalization of the economy: 42.40%, the average value of the indicator in 2020—61.41 points), and the negative impact of regulatory transparency (the average correlation with regulatory transparency is −1.20%, the average value of the indicator in 2020—66.42 points).

The authors offered recommendations to address these problems suggesting a 27.10% increase in the future orientation of regulation to 83.24 points and a 22.90% increase in the liberality of the economy to 75.47 points. Due to this, the activity of clustering projects will increase to 74.61 points (+23.67%), co-investment projects by 89.28%, and projects of cooperation between employees and employers by 32.20%. This will provide the following benefits to the economy: reduce the poverty gap at $3.20 a day to zero, reduce the human inequality rate by 67.58%, increase productivity by 102.92%, and increase human capacity by 23.32%.

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Financial Infrastructure in the Cooperative Sector of the Economy: Current Needs and Development Trends

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Abstract In this article, we aim to determine the current needs of the cooperative sector of the economy in terms of financial infrastructure. Moreover, we seek to identify the prospective directions of the development of financial infrastructure during the COVID-19 crisis. We determined the correlation and regression dependencies between the development of the cooperative sector (based on the example of cluster development) and the financial infrastructure elements. As a result, we proved that the financial infrastructure, to a large extent (68.05%), determines the development of the cooperative sector of the economy. The directions of financial infrastructure development that best suit the needs of cooperative sectors are: increasing the availability of venture capital, decreasing the tariffs, and lowering the influence of government corruption on business. Current needs are connected to decreasing the influence of corruption to 43.40 points (down 3.57%), lowering tariffs to 51.71 points (down 5.89%), and raising the availability of venture capital to 76.98 points (up 77.75%). However, this scenario has a 2–25% chance of happening. In a more probable scenario (18–24% chance), these elements would increase only partially. However, this scenario would still see a 28.245 increase in the corporate sector's well-being (to 69.88 points).

Keywords Financial infrastructure · Cooperative sector · Current needs · Development directions · COVID-19 crisis · Crisis management

JEL Codes C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

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1 Introduction

The cooperative sector of the economy was hurt the most during the COVID-19 pandemic in 2020. Integration processes in business are the first to collapse during recession and instability because business structures are forced to abandon mutual agreements. Avoiding joint decision-making is a standard practice of risk management during crises.

The most controversial part of this is that cooperation increases the economic resilience of enterprises, making them more stable and sustainable. Severing cooperative networks and ties is an "institutional trap" that could prevent enterprises from overcoming a crisis and even strengthen its negative effects on business. COVID-19 crisis was the most large-scale one in the last decades. In 2020, the decline in global GDP was 3%; the share of enterprises affected by the crisis still creeps to 100%, businesses suffer serious financial losses; insolvency and bankruptcy run rampant.

For this reason, it is especially important to use cooperative business mechanisms for mitigating and overcoming crises. We send forth the following working hypothesis: "Business activities in cooperative sector is largely defined by financial infrastructure—its development allows to activate the cooperative mechanisms during COVID-19 crisis and even launch anti-crisis measures already in 2021". This article aims to identify the current needs of the cooperative sector in financial infrastructure, as well as its perspective directions during the COVID-19 crisis.

2 Literature Review

The importance of financial infrastructure to the development of business is extensively studied in the works of several Russian and foreign scholars (Bogoviz et al. 2018; Bolgova 2017; Guseva et al. 2019; Medentseva 2017; Popkova and Alferova 2019; Sergi et al. 2019; Tarakanov et al. 2020). Various aspects of economic development via cooperation and clustering are a subject of numerous studies (Bogoviz et al. 2019; Casalegno et al. 2020; Galang et al. 2020; Huang et al. 2020; Kim et al. 2020).

Nevertheless, these studies only dwell on the general features of financial infrastructure, without accounting for the specifics of the cooperative sector. Moreover, the general sentiment is that the development of the cooperative sector only requires some elements of financial infrastructure. To fill these research gaps, we studied the current needs and directions for the development of financial infrastructure in the cooperative sector.

3 Materials and Methods

To get more accurate data on financial infrastructure, we sampled the top 10 countries in the fiscal response to COVID-19 in 2020 index (as of 12 January 2021). The statistics are presented in Fig. 1.

Figure 1 shows that fiscal response to COVID-19 in 2020 was significant in all countries. It was the highest among the sampled countries in Turkey (12.5% of GDP) and the lowest in Mexico (1.9% of GDP). To test the hypothesis, we identified the correlation and regression between the development of the cooperative sector (on the example of cluster development) and the indices of financial infrastructure, namely:

- Government regulation and taxation;
- Domestic credit to private sector;
- Venture capital availability;
- Insurance premium;
- Trade tariffs;
- Incidence of corruption.

Data on these indicators in the sampled countries is presented in Table 1.

We analyzed the data from Table 1 and created development scenarios for the cooperative sector in 2021, depending on the state of financial infrastructure. We will assume that the working hypothesis is proved if the following two sentences are correct:

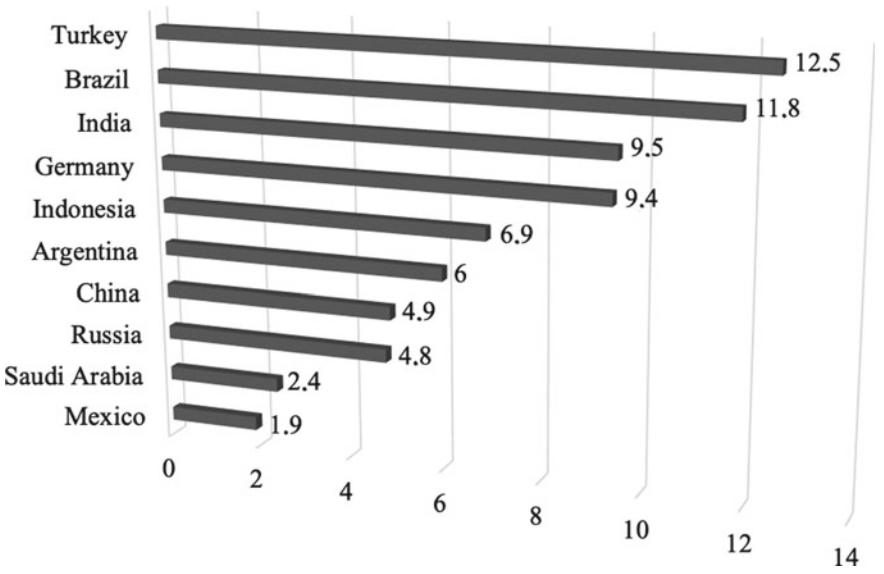

Fig. 1 Fiscal response to COVID-19 in 2020, % of GDP. *Source* Compiled by the authors based on World Economic Forum (2021)

Table 1 Financial infrastructure and the development of the cooperative sector of the economy in 2020, 1–100 points

Country	State of cluster development	Elements of financial infrastructure					
		Government regulation and taxation	Domestic credit to private sector	Venture capital availability	Insurance premium	Trade tariffs	Incidence of corruption
	Y	X_1	X_2	X_3	X_4	X_5	X_6
Mexico	54.7	31.1	35.6	38.3	38.3	65.85	28.0
Saudi Arabia	66.1	61.3	59.0	57.1	57.1	61.93	49.0
Russia	40.3	37.0	57.0	29.3	29.3	70.82	28.0
China	59.6	56.3	100.0	57.0	57.0	25.87	39.0
Argentina	40.8	27.1	15.5	22.1	22.1	24.58	40.0
Indonesia	59.4	50.8	41.1	45.9	45.9	62.80	38.0
Germany	73.5	56.9	81.6	63.4	63.4	92.55	80.0
India	54.3	51.8	53.0	52.7	52.7	3.80	41.0
Brazil	48.7	11.4	66.3	34.9	34.9	17.75	35.0
Turkey	47.5	44.1	72.9	32.4	19.2	62.35	41.0

Source Compiled by the authors based on World Economic Forum (2019)

- The average correlation of financial infrastructure indices with cooperation is more than 60%;
- In the optimistic scenario, the higher availability of the key elements of financial infrastructure will boost the development of the cooperative sector by 20% in 2021.

4 Results

The correlation of the development of the cooperative sector and the financial infrastructure indices, according to 2020 data, is presented in Fig. 2.

According to Fig. 2, financial infrastructure does significantly affect the development of the cooperative sector (average correlation of 68.05%). To establish a more accurate relationship of these indices indicators and to create a foundation for the subsequent scenario analysis, we compiled a regression equation, in which the multiple correlation was 98.54%:

$$y = 20.45 - 0.21X_1 - 0.11X_2 + 1.34X_3 - 0.37X_4 + 0.09X_5 + 0.06X_6 \quad (1)$$

Formula 1 demonstrates that the indices of the financial infrastructure that have the most impact on the cooperative sector are: venture capital availability (X_3), tariffs

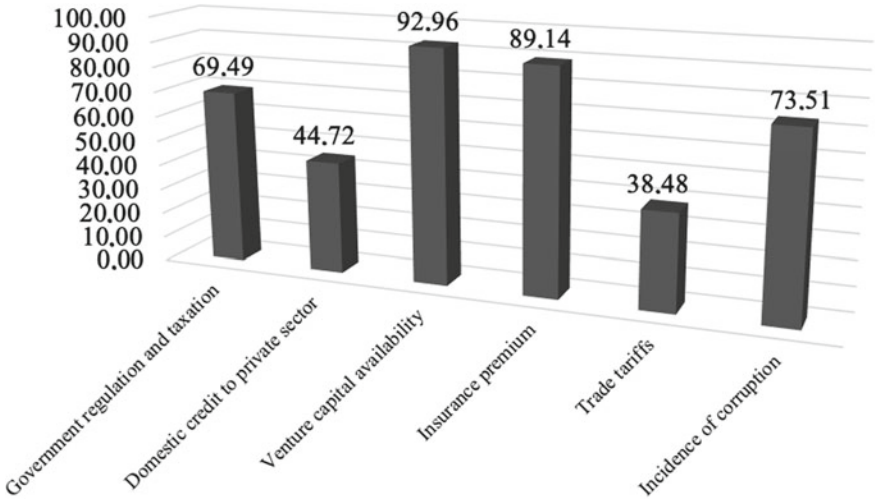

Fig. 2 Correlation between the development of the cooperative sector and the indices of financial infrastructure, according to 2020 data. *Source* Compiled by the authors based on World Economic Forum (2021)

(X_5), and the influence of government corruption (X_6). For each of these indices (based on Table 1 data), we calculated the mean ($\overline{X}$) and the standard deviation (SD). Then, we generated 100 random numbers and created normal distribution histograms: Fig. 3 ($\overline{X}_3 = 43.31$, $SD_3 = 13.89$), Fig. 4 ($\overline{X}_5 = 48.33$, $SD_5 = 28.56$), and Fig. 5 ($\overline{X}_6 = 41.90$, $SD_6 = 14.78$), respectively.

According to Fig. 3, the most probable value of the venture capital availability index in 2021 will be 53.98 points (24% probability). The worst-case prediction, out of the somewhat probable ones (10% + probability), will be 30.29 points (13%), which is still lower than the 2020 value).

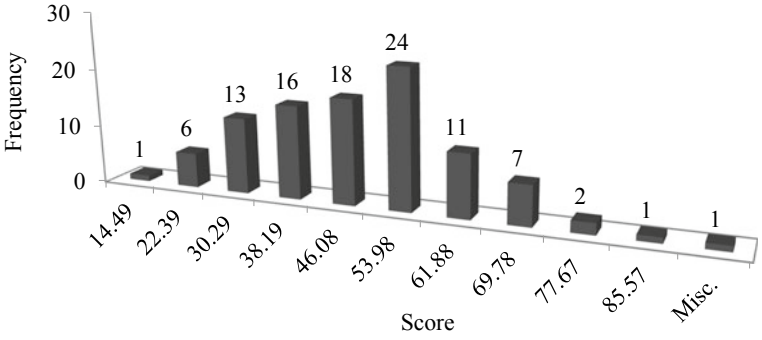

Fig. 3 Normal distribution histogram for venture capital availability ($\overline{X}_3$) in 2021. *Source* Compiled by the authors

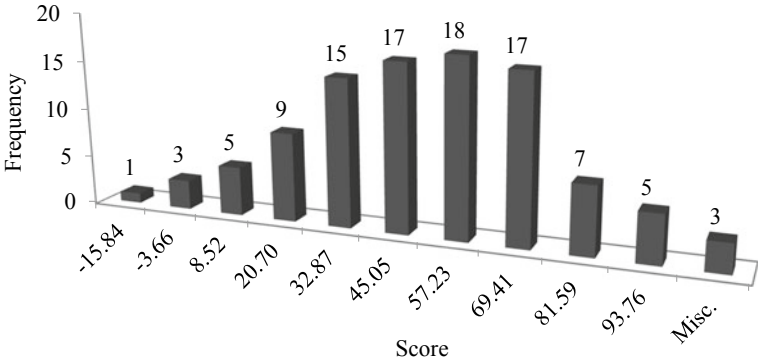

Fig. 4 Normal distribution histogram for tariffs ($\overline{X}_5$) in 2021. *Source* Compiled by the authors

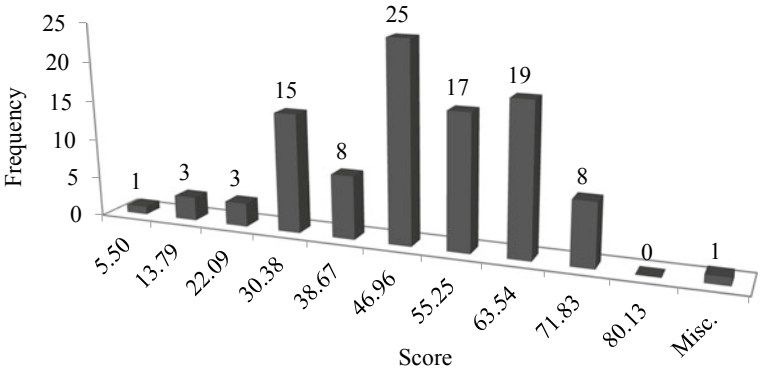

Fig. 5 Normal distribution histogram for the influence of government corruption ($\overline{X}_6$) in 2021. *Source* Compiled by the authors

Figure 4 demonstrates that the most probable value of the tariffs index in 2021 will be 57.23 points (18% probability), while the worst-case, somewhat probable value will be 32.87 points (15% probability).

According to Fig. 5, the most probable value of the government corruption index ($\overline{X}_6$) in 2021 will be 46.96 points (25% probability), while the worst-case, somewhat probable value will be 30.38 points (15% probability). We inputted the selected values into the Formula 1 equation and plotted an optimistic (Fig. 6) and a pessimistic (Fig. 7) scenario.

Figure 6 indicates that, under the optimistic scenario, the cooperative sector of the economy will develop by 28.24% to 69.88 points in 2021 due to the improved accessibility of the key elements of the financial infrastructure.

According to Fig. 7, the most pessimistic scenario will see a 35.98% decline in the development of the cooperative sector of the economy to 34.89 points. Moreover, we identified the current needs of the cooperative sector in financial infrastructure.

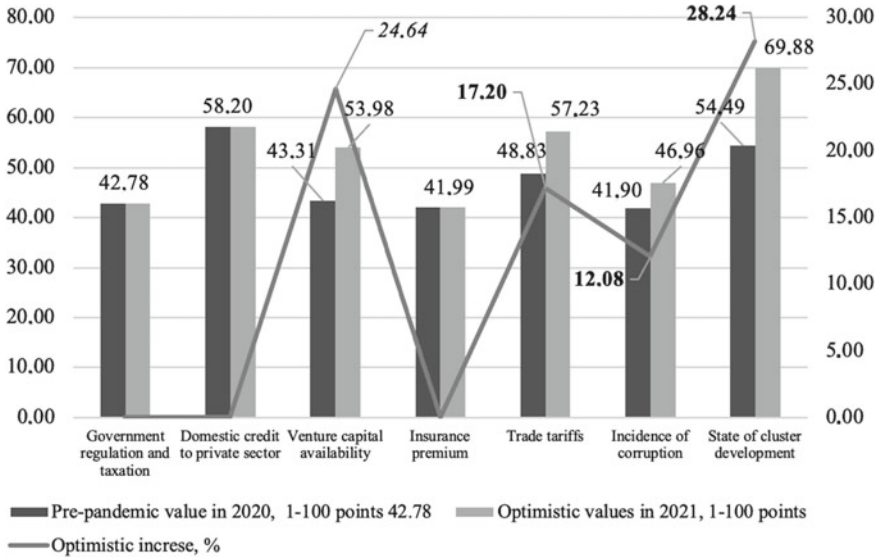

Fig. 6 Optimistic scenario of the cooperative sector development on the basis of the financial infrastructure in 2021. *Source* Compiled by the authors

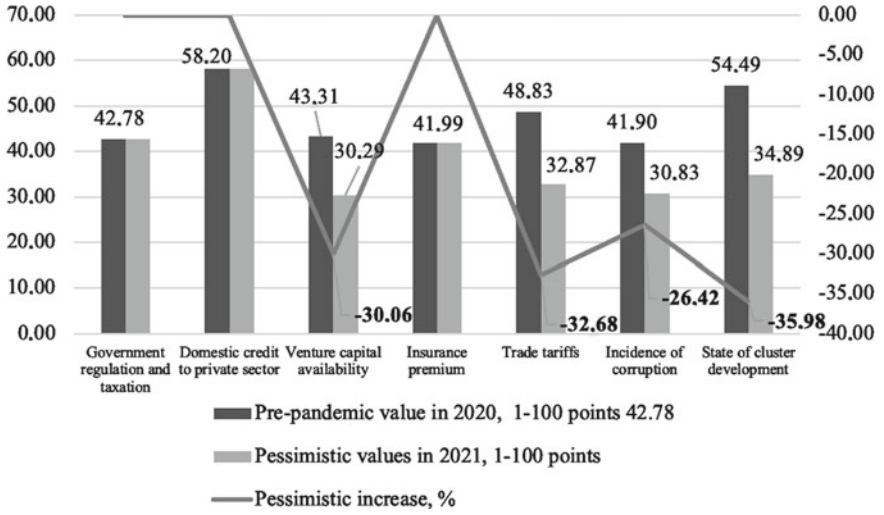

Fig. 7 Optimistic scenario of the cooperative sector development on the basis of the financial infrastructure in 2021. *Source* Compiled by the authors

The maximum development of the cooperative sector (100 points, up 83.52%) could be achieved if all the following statements are correct:

- The influence of government corruption on business reduces to 43.40 points (down 3.57%). According to Fig. 4, this has a 25% chance of happening;
- The tariffs reduce to 51.71 points (down 5.89%). According to Fig. 3, this has an 18% chance of happening;
- The availability of venture capital raises to 76.98 points (up 77.75%). According to Fig. 2, this has a 2% chance of happening.

5 Conclusion

We confirmed that financial infrastructure is essential to the development of the cooperative sector of the economy (68.05% correlation). The key elements of the financial infrastructure that impact the cooperative sector the most are: venture capital availability, lower tariffs, and decreased influence of government corruption.

Currently, the sector's development requires a 43.40 reduction in the influence of corruption (down 3.57%), a 51.71 reduction in tariffs (down 5.89%), and a 76.98 increase in the availability of venture capital (up 77.75%). However, this has a 2–25% chance to happen. In a more probable and more optimistic scenario (18–24% probability), these indices of financial infrastructure will increase only partially; this would, however, still lead to a 28.245 increase in the cooperative sector (to 69.88 points).

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Synergetic Approach to Describing the Cooperative System

Elena I. Semenova, Natalia V. Bykovskaya, and Alexey I. Afonin

Abstract The synergetic approach considers the processes of self-organization occurring in open systems. Modern views on cooperation in rural areas consider it as an element of self-organization in their development. The paper aims to study the system of consumer and production cooperation in agriculture. The paper implements the theory of complex systems to identify bifurcation points and determine the stability of the cooperation system. The input data includes the financial statements of agricultural production (20 units) and consumer cooperatives (23 units) of the Republic of Tatarstan. The authors choose the Republic of Tatarstan for their research since the region is a leader in developing agricultural cooperation in the Russian Federation. The selected study period is 2011–2019. The research results are presented graphically. The authors selected revenue and profit as the parameters of the system's state. The authors determine the bifurcation points in the system of cooperation of the Republic of Tatarstan in 2017 and 2018, which characterize the loss of stability of the system and its transition to another state. This process is caused by the impact of external factors on the cooperation system, especially state support measures. A polynomial and logarithmic dependencies describe the trend dependencies of the development of the cooperation system. The authors proved that consumer cooperation is less sustainable than industrial cooperation. In the further development of the system of cooperation in the region, the growth of selected parameters and sustainability is expected.

Keywords Synergy · Cooperation · System · Self-organization · Sustainability

JEL codes Q13 · O43 · P27

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1 Introduction

The synergetic approach considers the processes of self-organization occurring in open systems. Self-organization is the process of evolution of complex systems and the emergence of stable ordered structures (attractors) with new properties. The theory of self-organization was developed by Haken (1980). He regarded it as the emergence of new properties in a whole consisting of interacting objects and as an approach requiring the cooperation of specialists from different fields.

H. Haken, in his book (Haken 2005), supports the description of complex systems by examples from physics, chemistry, biology, economics, and psychology. We applied the synergistic approach to the system of cooperation.

In current conditions, cooperative entrepreneurship is a generally recognized factor in the development of a market economy. The variety of needs of the participants of cooperatives has led to the creation of different types of cooperatives. Moreover, there has emerged the need to regulate the legal situation for different types of consumer cooperatives. The cooperative movement is represented by production and consumer cooperatives.

Agricultural production cooperatives are based on the association of means of production. This phenomenon is widespread in Russia. They are represented by production cooperatives and Israeli kibbutzes. Production cooperatives are less developed in other countries.

Agricultural consumer cooperation has developed more widely, since organizations are non-profit and, depending on the type of their activities, are divided into processing, marketing (trade), servicing, supplying, gardening, horticultural, and livestock. In current conditions, the role and importance of cooperatives are growing. This is primarily determined by the fact that agricultural consumer cooperatives integrate economic and social objectives in their activities and focus directly on the interests of society and the individual (Semenova 2016).

Modern cooperatives differ from the cooperatives of the nineteenth century due to the changing conditions of economic management and the gradual adaptation of the cooperative movement to them, which is caused by the formation of new forms of cooperatives, changes in the functions performed, as well as the transformation of membership issues, voting procedures, income distribution, and property rights. This allows us to consider cooperatives as voluntary cooperation of independent entities and as institutions of self-development in rural areas.

Thus, Starodubrovskaya and Mironova (2010) refer cooperatives to self-development institutions since they unite the most active part of the local population. Kostyaev (2018) indicates that the self-development institutions of rural areas include cooperatives of all types, including territorial public self-government, social entrepreneurship, etc. Feldmane and Zvirbule (2020) studied the institutional framework of agricultural cooperatives. The EU rural spillover programs consider cooperation in the institutional structure of rural development. As institutions of self-development of rural areas, cooperatives ensure their sustainable development based on the resources used and the activity of cooperative members.

The paper aims to study the system of agricultural consumer and production cooperation using the theory of complex systems. Moreover, it identifies bifurcation points and determines the stability of the cooperation system.

2 Materials and Methods

The input data includes the financial statements of agricultural production (20 units) and consumer cooperatives (23 units) of the Republic of Tatarstan for 2011–2019.

The region was chosen because of its leadership in the development of agricultural cooperation in the Russian Federation. The region has a high share of small forms of farming, which produce 50% of agricultural products and represent great potential in the development of various cooperatives. The development of cooperation is significantly influenced by state support. For this purpose, the government allocated 2 billion rubles in 2018. In 2018–2019, the Republic of Tatarstan ranked 2nd by the number of established agricultural cooperatives among all Russian subjects.

The research results are presented graphically. The authors selected revenue and profit as the parameters of the system's state.

3 Results

The synergistic effect of cooperation is manifested in the coherence of the interaction of multiple attractors (cooperatives of different types) in forming a new quality.

In Fig. 1, curve A shows a cumulative graph of the proceeds from the sale of products by 20 agricultural production cooperatives of the Republic of Tatarstan for 2011–2019.

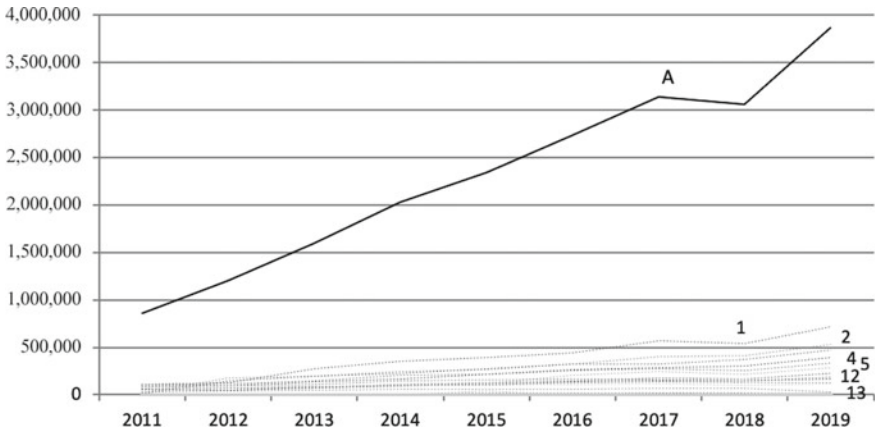

Fig. 1 The set of actual development trajectories of the system of attractors of production cooperation A (attractors 1–20). *Source* Compiled by the authors

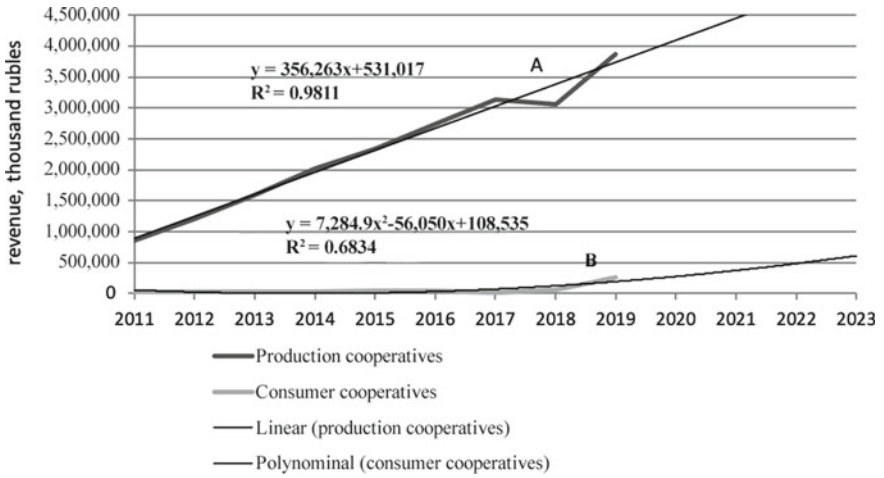

Fig. 2 The set of actual development trajectories of the system of production cooperation A (20 units) and consumer cooperation B (23 units) on the parameter of revenue. *Source* Compiled by the authors

In Fig. 2, curve A shows the total revenue of agricultural production cooperatives, and curve B shows the total revenue of agricultural consumer cooperatives. The revenues of agricultural consumer cooperatives are much lower than those of production cooperatives (on average, 39 times over the period). The trend dependencies are described by a linear equation for production cooperatives $y = 35{,}626x + 53{,}101$. The approximation reliability is decried as $R^2 = 0.981$. Polynomial dependence for consumer cooperatives is described by $y = 7284$, x^2-56,050x + 10,853, $R^2 = 0.683$.

The graphs show two bifurcation points, corresponding to 2017 and 2018, which are characteristic of both types of cooperatives. They show the moments of the system's transition to another state or the loss of stability of the cooperative system.

In Fig. 3, we plotted similar summary graphs for agricultural production and consumer cooperatives on the profit parameter. Trend dependencies are described by the logarithmic equation for production cooperatives $y = 24{,}732\ln(x) + 59{,}842$; the approximation reliability—$R^2 = 0.768$; polynomial dependence for consumer cooperatives—$y = 7284$, x^2-56,050x + 10,853; $R^2 = 0.683$.

According to the profit parameter, the sustainability of production cooperatives is lower than that of consumer cooperatives, because the profit curve for them has a greater number of bifurcation points. This can be explained by more stringent requirements for the activities of production cooperatives compared to consumer cooperatives: a share is constantly accounted for and changed based on the management results, the presence of subsidiary responsibilities, and the obligation of labor participation.

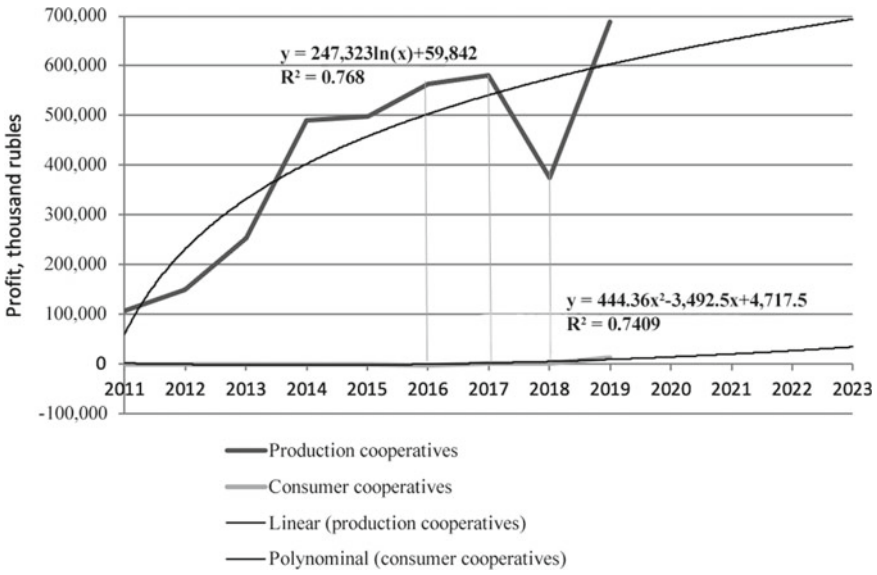

Fig. 3 The set of actual development trajectories of the system of production cooperation A (20 units) and consumer cooperation B (23 units) on the parameter of profit. *Source* Compiled by the authors

The development of agricultural production cooperatives is constrained by legislative norms of distribution of cooperative payments. The development of consumer cooperatives is constrained by the non-profit nature of the activity, which limits profits.

4 Discussion

Sustainability in statistics is defined by the coefficient of variation. This coefficient in the production cooperatives of the Republic of Tatarstan for the analyzed period is equal to 0.43 for revenues and 0.49 for profits. For consumer cooperatives, this figure is 1.32 and 3.32, respectively, which indicates a higher sustainability of production cooperation in the region.

The sustainability of cooperative structures is determined by external factors, especially state support. The system of support for agricultural cooperatives provides grants for the development of material and technical basis, the issuance of subsidies, and consulting support.

The forecast values represent a further development of the cooperative system up to 2023, which shows the growth of revenues and profits and increasing sustainability of the cooperative system.

5 Conclusion

The development of the cooperation in the Republic of Tatarstan in 2017 and 2018 has bifurcation points that characterize the loss of system stability and its transition to another state, which is due to the impact on the system of cooperation of external factors, especially state support measures. Polynomial and logarithmic dependences describe this trend dependences of the cooperative system development. The authors proved that consumer cooperation is less sustainable than industrial cooperation. In the further development of the system of cooperation in the region, the growth of selected parameters and sustainability is expected.

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The Impact of Business Structures Cooperation on Sustainable Development

Small Business in Russia After the Shock of 2020

Evgeny M. Bukhvald, Dmitry N. Lapaev, and Olga I. Mityakova

Abstract The paper examines the reasons for the tough circumstances that have developed in small and medium-sized enterprises of the Russian economy in 2020. The authors analyze the measures of state support for small and medium-sized enterprises in a crisis and the main requirements for this direction of state policy in the future perspective. Moreover, the authors analyze some changes in the institutionalization of state policy concerning small and medium-sized enterprises associated with introducing the concept of "public authority" and the reform of federal development institutions. The possible effects of these reforms on implementing measures to support small and medium-sized enterprises, primarily at the regional and local level, are considered. The analysis of the COVID-19 crisis revealed significant gaps in the current state support model for small and medium-sized enterprises, especially at the regional level. The authors show that the peculiarity of Russian small and medium entrepreneurship is that under the influence of crises, pandemics, etc., it is mainly not the formal number of small and medium enterprises that changes, but the number of actually operating economic entities, which is determined only by expert evaluation. The authors recommend expanding the practice of independent regional and municipal surveys of small and medium-sized enterprises, which can give grounds for effective measures to support small and medium-sized enterprises taking into account the peculiarities of the problems with their activity in a given territory.

Keywords Coronavirus economy · Small and medium entrepreneurship · State support · Federal development institutions

JEL Codes G01 · H12 · L26 · M21 · M48

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1 Introduction

With the introduction of anti-crisis measures of state economic policy in Russia, small and medium enterprises (SMEs) emerged as the primary recipient of the implemented support measures. This often gives the impression that the COVID-19 crisis stopped the *victorious march* of Russian small business just at the moment of its substantial rise. However, this is actually far from being the case. Over the past few years, SMEs of the Russian economy were not in the phase of recovery, but in a situation of apparent stagnation and even a decline from the positions of previous years. These negative trends of recent years significantly weakened Russian SMEs and reduced their resilience in the face of possible shocks.

The main reasons for this situation remain the lack of powerful sources of sustainable growth in the Russian economy and the lack of noticeable progress in the growth of real incomes and the purchasing power of the population. However, the apparent failure of attempts to qualitatively strategize the socio-economic policy in this area is also of particular importance. The "Strategy for the Development of Small and Medium Entrepreneurship in the Russian Federation until 2030" was detached from the overall context of the economic strategy of the country. In particular, the strategy does not contain any analyses of the risks or scenarios for macroeconomic and financial indicators. Similar to many other strategic planning documents, this strategy does not contain an algorithm for the actions of all levels of government in the event of an economic emergency (e.g., the economic consequences of the COVID-19 pandemic).

Indeed, the macroeconomic background of the strategy implementation turned out to be less favorable than the assumptions of its drafters. Simultaneously, neither the strategy itself nor its roadmap contained guidance on effective ways to provide emergency assistance to SMEs to survive the crisis and recover subsequently.

It is clear that the strategic priorities of the Russian public policy in relation to SMEs need a fundamental rethinking. Moreover, the crisis processes in Russian SMEs did not appear suddenly in 2020, but, as noted above, arose and grew for several years (Drobot et al. 2020, pp. 2413–2430). These processes manifested themselves in the stagnation and, in some cases, the reduction of the number of different types of SMEs, as well as the reduction of employment in this area of the economy, the lack of real progress in increasing the share of SMEs in the country's GDP, etc.

In this situation, we cannot limit ourselves to a formal update of the strategy or any other similar document. Such *updates* have been carried out many times before, most often without a serious analysis of the reasons for non-compliance with previous documents. Nowadays, there is a common thing to explain the difficulties and declines of SMEs in the economy of Russian regions by the negative impact of the pandemic. The lack of the effectiveness of state measures to support SMEs is explained by the limited funds, especially at the regional level. Evidently, the aftermaths of the COVID-19 crisis cannot be overcome only by the support measures to SMEs. Similar measures are needed in other sectors of the economy. It is also necessary to support social organizations and many segments of the population who

have lost their income sources. This hypothesis is also the basis of the modern practice of supporting entrepreneurship (Sukhotina 2020, pp. 192–197).

However, it should be noted that SMEs, as a target of the negative impact of the coronavirus economy, are marked with several weaker and stronger points (in particular, compared to large businesses). SMEs are weaker since they have virtually no *financial cushion* and have little chance for temporary credit support outside government benefits and guarantees. Due to the trade and service orientation, SMEs are more related to the factors of consumer demand and react negatively to the decline in living standards of the population. On the other hand, the significant share of shadow turnover and shadow employment makes it easier for SMEs to adapt to the negative changes in the economic situation (Revina and Smotrova 2020, pp. 44–48).

We must recognize that SMEs in the pandemic turned out to be one of the most significant beneficiaries of state support in the form of both *indirect financing* (tax incentives, preferential rent, etc.) and direct co-financing (subsidies to maintain employment and the wages of employees). However, the bulk of the effort in this direction was carried out and financed from the federal level. In other words, the system of SMEs support measures turned out to be even more centralized in the pandemic (according to our estimates, at least 80% of the directly and indirectly directed financial resources) than the development and support of SMEs under normal conditions.

This centralization seems inherently excessive, especially considering that the damage to SMEs in the regional economy turned out to be different under the influence of two factors: the spread of coronavirus disease and the structure of the SMEs sector in the region (the higher the share of trade and service SMEs—the higher damage).

In this sense, the policy of development and support for SMEs in the regions will see two important innovations in the nearest future. First, this policy will be formed in stricter fiscal constraints than before. Second, this policy will be increasingly focused not on creating new SMEs, but on their viability (i.e., preserving the existing SMEs and the restoration of those that stopped their activity in 2020).

2 Materials and Methods

One of the most significant innovations implemented during the introduction of amendments and additions to the Russian Constitution of 1993 was the legalization of the concept of public authority as an expression of unity and interaction of the state and municipal levels of power in the country. The primary meaning of the innovation was in the constitutional consolidation of the joint responsibility of the federal center, regions, and local self-government for the solution of all economic and social problems in the Russian Federation. This includes the implementation of a unified policy for the development and support of SMEs, including as part of overcoming the adverse effects of the coronavirus economy (Naumova 2020; Seliverstova 2020).

In recent years, the need for radical changes in this policy has been expressed clearly. The impact of the adverse effects of the COVID-19 pandemic in 2020 was only the *last straw* in the situation with SMEs. Two almost equivalent factors served as the reason for this. First, a long stagnation period of the Russian economy did not manage to fully overcome the effects of the economic crisis of 2008–2009, including indicators of real income and purchasing power of the population (i.e., the indicators that are very important for the dynamic development of the SMEs sector). The second reason is the trend of declining effectiveness of state support for SMEs, which could not be overcome by some *cosmetic* adjustments in the system of institutions of this support. Thus, the SMEs in the Russian economy has been "trampling in place" for ten years in terms of the number of SMEs and the number of employees; the share of this sector in the country's GDP also does not show steady growth (Bukhvald 2020, pp. 675–679; Nekrasova 2020, pp. 19–21).

The analysis of the reasons for this situation and its causes is complicated by the low reliability and constant delay in the publication of statistical data on the Russian SMEs. This also applies to the information on the amount of state support for SMEs, where there is no final data on the amount of funds allocated from all budgets (federal, regional, and local). According to estimates of the Accounts Chamber of the Russian Federation, about 80 billion rubles were allocated to support SMEs through various channels from 2014 to 2018. At the same time, the number of SMEs remained virtually unchanged over these years. The number of SMEs, with some fluctuations, remained at the level of 5.5–6 million, and the number of workers employed in this sphere of SMEs was in the range of 18.9–19.3 million people (Morozova 2020, pp. 19–21; Naumova 2020, pp. 675–679).

In 2019, Rosstat published data on the share of SMEs in Russia's GDP (21.9% for 2017). According to the Accounts Chamber of the Russian Federation, the contribution of SMEs to the Russian economy amounted to 19.0% in 2014, 19.9% in 2015, and 21.6% in 2016. However, in 2018, the Federal State Statistics Service (Rosstat) recorded a decline in the share of SMEs in GDP to 20.2% (i.e., to the level that appeared in the expert estimates of the early 2000s). Let us note that with some differences in the national criteria of SMEs, its share in the GDP of developed countries is 50–60%—51% in Great Britain, 53% in Germany, 60% in Finland, and 63% in the Netherlands. The passport of the National Project "Small and medium-sized Entrepreneurship and Support of Individual Entrepreneurial Initiatives" states that the share of SMEs in the GDP of the country is to be at the level of 32.5% by 2024, which, in our opinion, is practically unattainable in the current situation (Kobozeva and Vorobyova 2020, pp. 40–47; Seliverstova 2020, pp. 164–170).

As noted above, one of the main reasons for the stagnation of SMEs is the low effectiveness of its support measures at all levels of government and municipal administration. At the sub-federal (regional and municipal) level, the main reason for this situation is the lack of funds for such support and its considerable differentiation by region. At the federal level, a significant negative effect is caused by the institutional instability in the system of SME support. This refers to the constant replacements in the executive branch or other institutions charged with the leading role in implementing the national policy of development and support of SMEs in the national

economy. The actual final results of different strategies, programs, and roadmaps for the development and state support of SMEs have never been monitored or seriously analyzed.

Thus, at the federal level, since the beginning of Russian reforms, this segment of social and economic policy has consistently been the responsibility of the following government structures:

- State Committee for Antimonopoly Policy and Support of New Economic Structures;
- State Committee for Industry;
- State Committee of the Russian Federation for the Support and Development of Small Business (SCSDSB RF);
- Ministry of Antimonopoly Policy and Entrepreneurship Support;
- Federal Foundation for the Support of Small Business;
- Ministry of Economy (Economic development);
- SME Bank, SME Corporation.

Such a mess with the regulatory institution in the framework of the federal policy on SMEs was also negatively projected on the regional level of government. Thus, after creating the SCSDSB RF in 1995, similar structures were created in many subjects of the country. The SCSDSB RF sought to establish "vertical" interaction with newly established regional structures. After abolishing this executive body in 1998, similar regional structures were significantly reduced, and the practice of clear "vertical" interactions on this issue came to naught for a long time. The municipal level of government (except for a few of the largest cities—the capitals of the Russian subjects) was never fully included in this vertical, because it simply had no economically significant budgetary resources to finance SMEs.

Thus, one of the main problems of state policy in relation to SMEs is its "vertical imbalance" in terms of resources used (an ever-increasing share of federal resources of state support for SMEs) and institutional instability. As we believe, the way out of this situation is the restoration of an institutionally and economically balanced vertical in the system of state support for SMEs. The basis for this can be formed by the principle of unity of public power and the interaction of all its components currently enshrined in the Constitution of the Russian Federation.

The updated Constitution of the Russian Federation repeatedly refers to the concept of "public authority," which is new to us. After the approval of the "public authority" institute, the Government of the Russian Federation initiated a reform of the leading federal institutions of development, primarily focused on strengthening and interaction between the governing bodies within a single system of public authority. Development institutions are one of the key tools of socio-economic policy of the state, focused on solving those problems that most often cannot be solved by market mechanisms of economic management and require state intervention. Nowadays, the concept of "development institution' is not uniformly defined by legislative acts. The legal foundations of existing development institutions are regulated by various laws and even by separate subordinate legal acts.

3 Results

As an instrument of socio-economic policy, development institutions have several features and advantages that are significant in terms of their potential contribution to the development of SMEs in the Russian economy. First, as an instrument of strategic management, development institutions can function coherently as an institution of the federal or regional level. This specificity can be fully projected on the role of development institutions in solving the problems of development and support of SMEs. All development institutions involve close interaction and co-financing from both the country, its constituent entities, and often from the municipal level. The co-financing from each budget level can be implemented in direct (investments in production and infrastructure facilities; subsidies and grants to residents) and indirect forms (tax and customs benefits to residents). Finally, all effective development institutions rely on the active use of public–private partnerships, including solving the problems of development and support of SMEs.

However, until recently, the activities of development institutions (at least, as far as development institutions of the federal level are concerned) have attracted considerable criticism from official structures (e.g., the Accounts Chamber of the Russian Federation) and individual experts. First, it has been noted that budgetary allocations into development institutions do not produce the desired effect in terms of an increase in the volume of economic activity, investment, jobs, and revenues at all levels of the country's budgetary system. Nevertheless, the practice shows that there are very few alternative instruments for boosting the national economy. In this regard, the Russian government abandoned the previously introduced moratorium on creating new special economic zones (SEZ); the list of advanced special economic zones is being expanded, including those in single-industry towns of Russia. For example, the year of 2020 saw a record number of newly created SEZ (eight new zones). Currently, there are 38 SEZ operating in Russia, which have attracted 830 residents with a declared investment volume of more than 1 trillion rubles. Additionally, as of the beginning of 2021, there have been 22 advanced special economic zones (ASEZ) in the Russian Far East and one ASEZ within the Russian Arctic zone. The practice of creating ASEZ in single-industry towns has become even more widespread. Currently, 92 ASEZ have been created in single-industry towns, including five single-industry towns that are simultaneously closed administrative-territorial units (CATU) and three ASEZ in CATU that are not single-industry towns.

Apparently, positive changes in the activities of development institutions, if they occur, are very slow. The declared volumes of investment are not realized, the export activity of SEZ and ASEZ remains very weak. The share of truly innovative products produced by the entities of SEZ and ASEZ remains low. Often, the same types of products are produced within SEZ and in conventional economic regimes. The subjects of SEZ and ASEZ do not show sufficient activity in promoting a cooperative network of SMEs, including cooperation on the generation and implementation of innovative developments. This significantly limits the overall socio-economic effect

of SEZ and ASEZ and narrows their role as an instrument of spatial development policy (Dorzhieva and Ilyina 2000, pp. 58–72; Polyanin et al. 2020, pp. 32–44).

In November 2020, the Government of the Russian Federation announced one of the most notable reforms with regard to development institutions as organizational structures that play the role of a guide from the strategic priorities of the state in the socio-economic sphere to their practical implementation on the ground, including efforts to develop SMEs. Until recently, there have been 40 different development institutions at the federal level in the form of various foundations, banks, and corporations. All of them were created to solve various problems, including those directly related to the support of SMEs, although, in reality, all effectively functioning development institutions inevitably give impetus to the spread of small forms of economic activity.

The main reference point of this stage of reform is to increase the socio-economic performance of development institutions, which can lead to strengthening their contribution to the development of the Russian economy and a more consistent solution to the development and support of SMEs. One of the conditions for advancing along this path is the restructuring of the functionality of these institutions on the principles of unity and interaction among all levels of public authority in the country. In other words, one of the main tasks in the activity of Russian development institutions is to unite or integrate the efforts of federal, regional, and municipal authorities based on public power in solving the most critical economic problems, including the development of SMEs. In this case, it is the question of combining financial, organizational, informational, and human resources, as well as the creation of a methodological framework for all issues of socio-economic policy addressed with the participation of development institutions.

In the sphere of SME development and support, the main task of development institutions, both federal and regional, is, on the one hand, to help small and medium-sized start-ups to attract investment to establish their businesses and, on the other hand, to help each start-up to have a clear and effective growth strategy with good marketing and other support. The role of development institutions is also to prevent SMEs from getting into critical situations that can put entrepreneurship on the brink of survival. At the same time, it is important to form such a practice, in which the interests of SMEs would be implemented not only through specialized institutions of its support, but also through all other institutions of sectoral and spatial development.

However, it should be borne in mind that the strengthening of the contribution of development institutions in addressing key issues of SMEs' development and support depends not only on the quantitative and qualitative performance of these institutions, but also on the clarity of their positioning in the institutional and instrumental apparatus of strategic planning. Currently, the institutional and instrumental apparatus of strategic planning in the Russian Federation is not structured and target-oriented. In fact, the same goals, including "national development goals," are implemented through a system of state programs, federal and regional projects, federal and regional development institutions, etc. Thus, this situation creates additional difficulties for the positioning of development institutions in the system of policy instruments to develop and support SMEs. In this regard, it is essential that participation in the

development and support of SMEs become not just a burden for the entire range of development institutions. This activity should be based on a clear definition of the tasks that each of these institutions should focus on according to its general functional specialization and the region's specifics of its spatial location.

To solve this problem, we believe it necessary to state the following conclusions.

First, it would be most desirable to develop and adopt a unified Federal Law "On Development Institutions of the Russian Federation" with an indication of the role of these institutions as one of the tools of policy for the development and support of SMEs. Since 2017, the Ministry of Economic Development of the Russian Federation is developing a law on the functioning of territories with preferential economic regimes. The law should define a unified mechanism for the formation and operation of such territories, taking into account their different types. The law should also specify approaches to defining the goal of creating and localizing such territories and synchronizing this process with the long-term goals of regional development, including the tasks of developing SMEs.

Second, given the spatial specifics of development institutions, their role as one of the tools of the SMEs development and support policy can be effectively implemented only based on the federalization of this policy and a balanced (within all levels of public authority) distribution of economic resources.

4 Conclusion

It should be noted that the coronavirus crisis revealed significant gaps in the current model of state support for SMEs, especially at the regional level. There are three main negative factors to be considered and overcome in the future. The first negative factor is the lack of a preconceived algorithm of actions in case of crises in the economy. The second negative factor is the lack of financial reserves at the regional level of the budget system necessary to launch emergency measures to support entrepreneurship without waiting for assistance from the federal level. The third negative factor lies in the limited regulatory (especially fiscal) tools available to the Russian subjects that are sufficient to effectively support SMEs and consider the specific situation prevailing in each region.

Finally, the situation in the sphere of statistical observation of SMEs should be streamlined. It is challenging to develop effective measures to support SMEs at the federal and sub-federal levels without having a reliable picture of the current situation in this area of the Russian economy. Data on the dynamics of SMEs from various sources (current data from the Federal State Statistics Service, data from periodic surveys of SMEs, data from the Ministry of Economic Development of the Russian Federation, and data from the Federal Tax Service) do not match up significantly. One of the reasons for these discrepancies is the significant and constantly fluctuating gap between the nominally listed and actually operating SMEs. In this case, the peculiarity of Russian small and medium entrepreneurship is that under the influence of crises, pandemics, etc., it is mainly not the formal number of small and medium

enterprises that changes, but the number of actually operating economic entities, which is determined only by expert evaluation. The solution to these problems could be the expansion of the practice of independent regional and even municipal surveys of SMEs, which can give grounds for effective measures to support SMEs taking into account the peculiarities of their activities in a given territory.

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Financing of Activities of Modern Educational Organizations Based on Sustainable Long-Term Relations with Clients: Endowments (US Experience)

Artur A. Maksaev and Natalia E. Petrovskaya

Abstract The article considers the role of endowments as an additional source of financing for the activities of universities. The example of the largest American educational endowments shows the financial and investment strategies of management companies. The average rate of return of funds is given depending on the investment period and the size of the target capital. Issues of replenishment and distribution of endowment funds were analyzed. One of the indicators of efficiency of the target capital in the sphere of education is considered—the ratio of the size of endowment to the number of students. The work uses the method of analysis, comparison and expert assessments. The research is based on the study of data from official American statistics, as well as data from NACUBO and TIAA, information and statistical reports from the largest endowment funds of American universities. Target capital makes it possible to receive stable extrabudgetary funds. The university's endowment is an important mechanism for financing long-term innovative development, as well as a modern tool to increase the financial sustainability of the university. Thanks to the endowment fund, strategies are being formed for years to come.

Keywords Endowment · Target capital · Education · University · USA

JEL Classification I22 · I23 · G32

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1 Introduction

According to philanthropist Potanin, "Endowment funds for Russia are an innovative thing. This is the most important form of ensuring independence, autonomy, the most important political solution" (Potanin 2010).

The word "endowment" is borrowed from English and literally translated as a contribution or donation. Endowment refers to a part of the property of a non-profit organization formed through donations and transferred to the trust of the management company in order to generate income used to finance the statutory activities of a non-profit organization (Oracheva and Samoletova 2017).

In 2006, a law was adopted in Russia where the term "target capital" is used instead of "endowment." Also in Russian practice, the concept of "support fund" is used.

2 Materials and Methods

In this article, with the involvement of primary sources based on a systematic approach, analytical and statistical methods of scientific research, the American experience of endowments in the field of higher education is considered.

The research is based on the study of official American statistics, NACUBO and TIAA data, as well as information and statistical reports of the largest endowment funds of American universities.

3 Results

According to the National Association of College and University Business Officials (NACUBO), in 2018 in the United States and Canada there were more than 800 educational institutions with endowment funds, the total assets of which amounted to $770.8 billion. 106 funds amounted to more than $1 billion. The median endowment in education is $142 million (NACUBO and TIAA, Study of Endowments 2019).

The list of the 10 largest endowment funds in the United States is given in Fig. 1. Each endowment has its own managing investment company that trusts these funds. As a rule, these companies are created on the basis of universities and are engaged in the operational management of endowments. US universities always emphasize that foundation employees are graduates of this institution and are certified financial and investment analysts.

It should be noted that sometimes the management company of the endowment fund is engaged in other types of investment activities, for example, it manages the funds of the University of Pennsylvania staff pension fund.

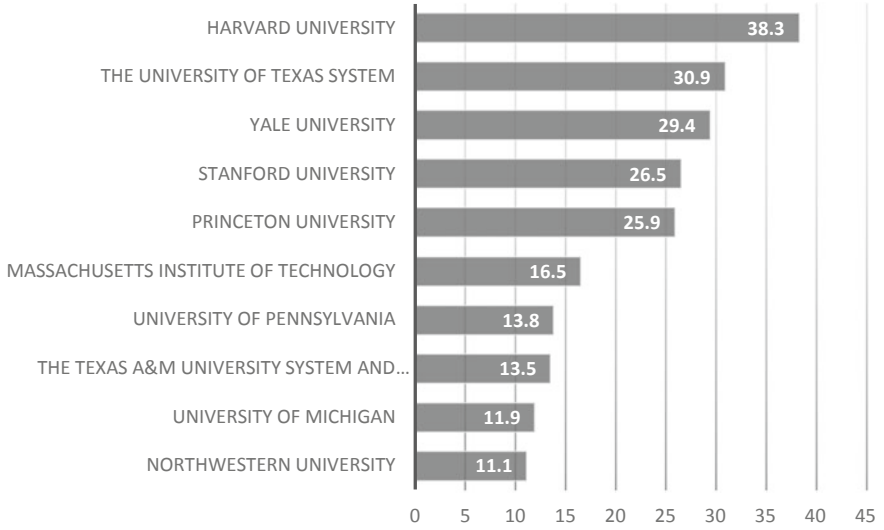

Fig. 1 The largest endowment funds of universities in the United States as of 2018, in billion dollars. *Source* NACUBO and TIAA (2019)

The endowment fund is an instrument for the long-term development of the university. Although only a relatively small part of the endowment can be spent each year, its payments provide a significant part of the income of universities. In general, from 25 to 54% of the income of American universities comes from income from its endowment fund. For example, at Yale University—34%, and at Princeton University—54%. Figure 2 below shows the Yale budget revenue chart.

Endowment funds allow the university to conduct innovative research, preserve and transfer knowledge and provide a high level of education to talented youth both now and in the future. The endowment fund helps universities stay in the forefront

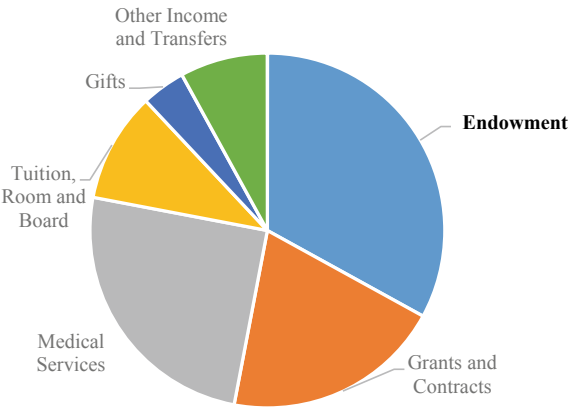

Fig. 2 Operating Budget Revenue, 2018 FY. *Source* The Yale Endowment (2018)

of teaching and learning as costs increase, knowledge expands, new technologies are invented and international competition increases. Such trust capital funds in the United States are the largest financial asset and are a constant source of financing for current and future generations.

In fact, endowment funds include a collection of earmarked capital funds that support specific goals. There can be thousands of such funds. For example, the Harvard Foundation consists of more than 13,000 funds. (The endowment is made up of more than 13,000 funds). University of Michigan—11,000, Stanford University—7,000, Princeton Institute of Technology—4,000 funds.

The generated target capital must be managed. The task of the management company is to invest in such financial instruments that can provide a constant increase in the endowment fund. Management companies plan a yield of at least 5% per annum. While one-year returns are important, many endowment managers use a 10-year average annual return as a target for long-term planning. According to the results of the special survey NACUBO and TIAA Study of Endowments, the yield varies depending on the size of the fund and the timing of investment (Table 1). Most of the funds with the size of target capital from 51 to 250 million dollars, such in the USA in 2018 f.g. there were 349, and their average ten-year yield was 5.6–5.7%. The highest yield according to the results of one year of investment in endowments in the amount of more than $1 billion is 9.7%.

Investment strategies are extremely important. Thanks to them, the fund can grow significantly. For example, at the Princeton Institute of Technology in 1995, the endowment fund amounted to $3.5 billion, and after 20 years it amounted to $22.2 billion (Princeton Alumni Weekly 2018) and continues to grow. Yale continues to maintain a well-diversified portfolio. The return on investment at Yale University in 2018 was 12.3%.

In Table 2 investment strategies of the largest US endowment funds are presented, asset classes are shown. Funds invest in Absolute Return from 19 to 26% of finances. The rest of the numbers are very different, and in annual financial reports, each proves that his strategy was the most winning.

Table 1 Average 1-3-5-10 net returns for fiscal year 2018, %

Net annualized return	Average	Over $1 billion	$501–1000 million	$251–500 million	$101–250 million	$51–100 million	$25–50 million	Under $25 million
1 year	**8.2**	9.7	8.7	8.5	7.9	7.7	7.5	7.6
3 year	**6.2**	6.8	6.2	6.1	6.0	6.0	6.0	6.2
5 year	**7.3**	8.2	7.4	7.3	7.1	7.0	7.0	7.5
10 year	**5.8**	6.0	5.6	5.7	5.6	5.7	6.1	5.8
Total Institutions								
	802	104	85	88	195	154	103	73

Source NACUBO and TIAA Study of Endowments (2019)

Table 2 US largest endowment management investment strategies, %

Asset Class	Yale University	Princeton University	University of Michigan	Stanford University	Northwestern University	Education Institution Mean
Absolute Return	26.1	25.0	22.1	22.0	19.0	21.7
Domestic Equity	3.5	9.0	25.9	7.0	13.0	20.4
Foreign Equity	15.3	16		20.0	17.0	22.8
Fixed Income & Cash	4.2 + 0.5	5.0	6.6 + 2.5	7.0	8.0	8.8 + 3.3
Leveraged Buyouts	14.1					6.1
Natural Resources	7.0		8.2	9.0	16.0	8.2
Real Estate	10.3	18.0	8.7	8.0		3.2
Venture Capital	19.0		13.0			5.5
Private Equity		27.0	13.0	27.0	22.0	
High Yield Credit					5.0	

Source Compiled by authors based on analytical reports Yale University, Princeton University, University of Michigan, Stanford University, Northwestern University (The Yale Endowment 2018; Princeton University 2019; University of Michigan 2018; Northwestern University 2019).
*Invested in various credit markets, including distressed debt and other credit instruments with fixed-income characteristics

The fixed capital of the endowment fund remains untouched, financing of various university programs comes only from income from investment activities. Moreover, the great efforts of universities are aimed at constantly replenishing the endowment fund with charitable contributions/donations. In the United States, there are certain technologies for conducting charity events. Charity activities intensify the work of the entire university, set and achieve global goals. Some of these charitable companies can last several years and allow attracting a large amount of money from thousands of former graduates (Sikle 2010). They managed to raise $1.1 billion from 72 thousand sponsors. University of Pennsylvania in 2018 $686 million was raised, the highest in university history (Penn University of Pennsylvania 2019).

Each university independently decides what it is more important for it to send money from the target capital fund. For example, the Stanford Foundation allocates approximately 5% of the total cost of endowment to university expenses annually. In 2018, this amounted to $1.2 billion. The distribution of these funds is shown in Fig. 3.

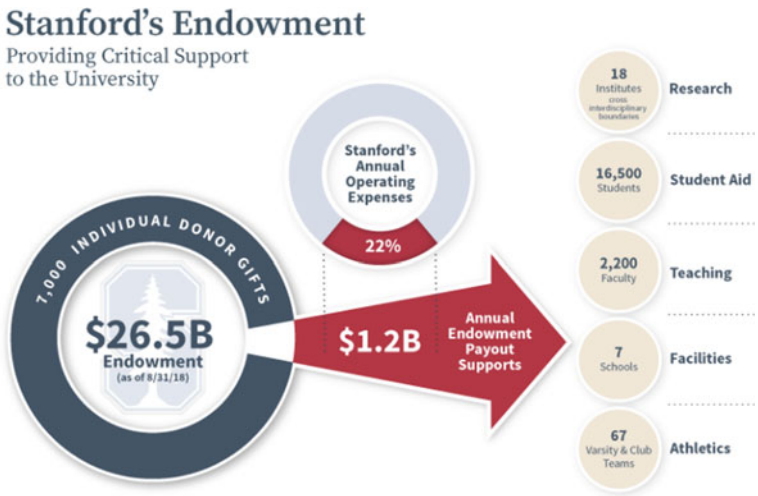

Fig. 3 Stanford's endowment. *Source* Stanford Management Company (2019)

There is no world rating showing the effectiveness of the endowment. One indicator of the effectiveness of endowments in the field of education in the United States is the size of the target capital fund per student. It is noteworthy that in the first place is not Harvard, which has the largest foundation, but Princeton University (Fig. 4). It is important to note that this indicator is not always informative. For example, Kentucky has Berea College, which has nearly 1700 students. Students are taught completely free of charge, moreover, each student receives a scholarship for four years, with a total volume of about 100 thousand dollars, and all this is possible thanks to the endowment fund of this college (Berea College 2019). There are other examples when the university, having a multi-billion-dollar endowment fund, does not provide scholarships to all students.

Of course, American endowment funds have reached such impressive volumes and results of activities for decades, and some for centuries. For example, the Princeton Institute of Technology endowment fund was created simultaneously with the university in 1746 to provide scholarships to students. And the Northwestern University endowment was created in 1851.

The topic of targeted capital in Russia began to be studied and developed about 15 years ago. The main law in force is Federal Law No. 275 of 30.12.2006 "On the procedure for the formation and use of targeted capital of non-profit organizations."

According to the information of the Vladimir Potanin Charitable Foundation, as of 2018, there were 177 active endowment funds in Russia, of which 104 (58.76%) are in the field of education (Oracheva 2018). Most of it is located in Moscow and St. Petersburg.

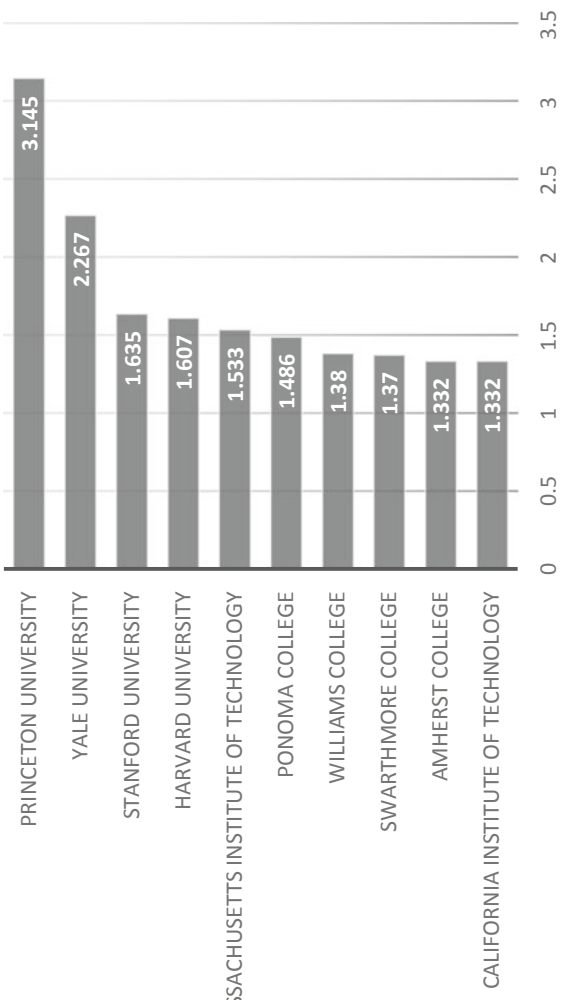

Fig. 4 The amount of the target capital fund per student as of 2019, in million dollars. *Source* Endowment per Student at Selected Colleges (2019)

4 Conclusion

The relevance of studying foreign experience is due to the need to diversify sources of financing and introduce innovative practices into the activities of Russian universities. The endowment funds of American universities are an important mechanism for financing long-term innovative development. Thanks to the endowment fund, strategies are being formed for years and even decades to come. Target capital makes it possible to receive stable extrabudgetary funds. Helps universities feel more confident and stable.

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State Support as the Foundation of Sustainable Economic Development

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Abstract In this study, we examined such aspects of state support in the Republic of Tatarstan as: material resources, capital, and productivity of small and medium-sized enterprises (SMEs). We outlined and analyzed the problems that entrepreneurs currently face. The government proposed several solutions to these problems in the form of state programs and state support for cooperative SMEs of Russia. Building upon our analysis of the problems, we offered ways to improve the effectiveness of policies and support from the government and social partnerships.

Keywords Productivity · State support · Capital · Material resources · Medium-sized enterprises · Small enterprises · State programs · State support · Economy

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1 Introduction

Recently, there has been a lot of emphasis on developing small and medium-sized enterprises in Russia. State support for small and medium-sized enterprises (SMEs) is an element of the strategic program of national economic development. SMEs are highly adaptive to changes in supply and demand in the consumer market. The development of SMEs promotes healthy competition, increases state budget inflow

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via taxes, and reduces unemployment by creating additional workplaces (Vakhitov 2019).

State support for entrepreneurship presupposes creating favorable legal and economic conditions, directly investing financial and material resources, and incentivizing the development of production. The long-term strategy of socio-economic development plans to expand the economic role of SMEs by 60–70% by 2030. The following forms of state support for SMEs are deemed the most effective ones (Bazarov et al. 2021):

1. Information and consulting: creating a stable information system that services the needs of SMEs in free and comprehensive information on conducting business;
2. Financial: supporting entrepreneurs;
3. Capital: expanding the rights of entrepreneurs to use state property (without transferring ownership) freely;
4. Infrastructural: creating multi-purpose funds and innovation centers.

Additional ways to support SMEs are: making SMEs eligible for state procurement and simplifying the rules for statistical reporting and bookkeeping.

2 Methodology

In this study, we used the materials of the National Project "Productivity and Employment Support" in the Republic of Tatarstan; statistical data on state support for the economy, industry, and export in the Republic of Tatarstan and the Russian Federation. Data on state support were taken from the website of the Ministry of Economic Development and the Ministry of Finance of the Russian Federation[1].

The methodology of this study is based on the usage of the following:

- Comparison of quantitative indices of state support and state policy of the Russian Federation;
- Analysis of economic indicators of sustainable economic development in the country;
- Comparison of data via analyzing the structure and dynamics of change;
- Graphical presentation of information.

To evaluate the effectiveness of state policy and state support of the Russian Federation, we used quantitative and qualitative research methods.

[1] Ministry of Economy of the Republic of Tatarstan (n.d.) Official website. Retrieved from https://mert.tatarstan.ru/

3 Results

Most entrepreneurs believe that the government has no idea what SMEs need. The surveys show that SMEs were in much better condition before the experiments with legal provisions, the increased VAT, new cash registers, and the implementation of the "Platon" system. Constant changes in the business environment throw all well-regulated processes off track.

Currently, entrepreneurs feel discouraged about taking loans. The key rate of the Central Bank of Russia fluctuates, which changes the terms of credit as well. The time to take out a loan has also increased (it used to take only around three weeks). The credit collateral has risen to enormous proportions, and so did the number of bureaucratic regulations (Vasilevich 2019).

The main problem that the entrepreneurs face is uncertainty about the future, not administrative hurdles or sudden inspections. Statistical data shows that the number of SMEs stagnated in recent years (Bazarov et al. 2018).

The Government of the Republic of Tatarstan developed and started implementing several programs to fix these issues. Social entrepreneurs are now eligible for soft micro-loans and the new credit program "Social Entrepreneur" (up to 5 mln. RUB with 5% interest). This measure is aimed at the businesses that solve the social problems of the population. Moreover, the regional government launched several seminars, workshops, and even a master's program "Project Management in Social Entrepreneurship" at the Kazan State University. This program yielded its first results in 2018—three projects in the Republic of Tatarstan received 11.5 million RUB in financial support. Due to this support, the "Gravitekhnika" LLC opened a programming and robotics class for children. The program allowed the "Yelabuga Enterprise of Capping and Plastic Products" LLC not to terminate their visually impaired workers. Moreover, the "Center of Early Help" launched their "Active Start" program that helps children at risk of developmental disorders. In 2019, 10 projects in the Republic of Tatarstan received over 31 mln. RUB of state support[2].

In the Republic of Tatarstan, the National Project "Productivity and Employment Support" was launched on September 24, 2018. This project aims to increase the number of entrepreneurs to 10,000 people by 2024 and raise the labor productivity of enterprises that contribute to the gross regional product by 5% annually. The priority directions of the project include the following:

- Increasing the quality of the national legal system;
- Raising the investment amounts;
- Improving the business environment;
- Training highly-qualified professional workers;
- Removing infrastructural obstacles that hinder the economic potential of the regions;
- Creating a robust technological foundation;
- Forming competitive industries that surpass the global growth rate;

[2] See Footnote 1.

- Expanding non-raw-material exports.

The National Project mainly focuses on manufacturing, construction, transport, and agriculture (Bazarov et al. 2021).

The project comprehensively deals with increasing labor productivity. It consists of three parts, represented by federal projects. The Ministry of Economic Development flagships the project "System Measures," aimed at applying advanced technologies, developing new management and production methods, and reducing administrative restrictions.

Under this project, an entrepreneur can take a loan of 50–300 mln. RUB for expanding their export capacity. The loan terms: up to 60 months with 1% interest and at least 20% of co-financing with the entrepreneur's own funds. Loaned funds may not be used for the creation, purchase, or repair of fixed assets, as well as for the development and manufacturing of military products. Moreover, the loan funds cannot be added to working capital or used for repaying previously taken loans and interest. The project also includes the so-called export accelerators—an educational program that promotes export expansion with the help of international mentors, internships, and seminars. The project is expected to result in better conditions for the growth of SMEs revenue, expansion of soft loans, lessening administrative control, easing tax burden, forming managerial competencies that correspond to the new business realia.

The second part is the "Address Support" project, managed by the Federal Center of Competencies. The project aims to introduce and popularize lean manufacturing in SMEs via direct worker training, grant support, and other financial budgetary means. This would lead to the increased revenues and solvency of SMEs, optimization of their working capital, reduction in manufacturing times, and improvement of the production quality.

The third part, "Employment Support," is curated by the Ministry of Labor and Social Protection of the Russian Federation. The main task of the project is to modernize the public employment services, which would lead to faster and better fulfillment of vacancies in enterprises (Ivanov and Korobova 2018).

Since 2016, the Investment and Venture Fund of the Republic of Tatarstan became an authorized body of the Industrial Development Fund of the Russian Federation (IDF). Jointly, they launched a competition-based program of co-financing (via soft loans) the projects that aim to produce quality import substitution goods. Investment and Venture Fund provides consultations on all programs of the IDF.

The programs "Development Projects" and "Components" of the IDF grant loans in the amount of 20–100 mln. RUB for up to 5 years, with an annual interest of 1–5%. To be eligible for the program, a project must have good market prospects, as well as high sustainability and financial-economic efficiency. Moreover, the product should have a high potential for export, import-substitution, or scientific-technological progress.

According to the Ministry of Economy of the Republic of Tatarstan, there are 153,157 SMEs in the region. Around 533.3 thousand people work in SMEs (including

individual entrepreneurs). According to these indices, Tatarstan occupies first place in the Volga Federal Region and sixth place in Russia[3].

In 2020, the implementation of the National Project "Small and Medium-sized Entrepreneurship and Support of Individual Entrepreneurial Initiatives" continued in five directions;

1. Improving the business environment;
2. Expanding the access of SMEs to financial resources, including soft loan financing;
3. Acceleration of the SME subjects;
4. Creation of farming support system and development of rural cooperation;
5. Promoting entrepreneurship.

As a result, more than 31 thousand SMEs and individual entrepreneurs received consultations and more than 7.9 bln. RUB of support was paid out. Moreover, over 13 thousand private persons took part in various events aimed at promoting entrepreneurship. Of these, more than 2.3 thousand people took courses in the basics of entrepreneurship, and more than 330 people started their own ventures.

The Republic of Tatarstan is currently implementing 32 state programs that affect most economic and social life sectors. In 2020, 353.4 bln. RUB was allocated for these purposes, including 250.6 bln. RUB from the regional budget, 56.3 bln. RUB from the federal budget, 3.1 bln. RUB from local sources, and 43.4 bln. RUB from the non-budget sources. In the same period, the Microfinancing Center issued 674 micro-loans (up by 69%, compared to 2019) to SMEs with a total value of 1.235 mln. RUB (up by 32%, compared to 2019). Out of those, 254 loans were soft ones (at 1% annual interest) in value of 295.1 mln. RUB[4].

Currently, the preferential leasing program is in high demand. This program supports SMEs and individual entrepreneurs that want to purchase new high-tech industrial equipment, including that for processing and storing agricultural products. Regional Leasing Company of the Republic of Tatarstan provides leased equipment on favorable terms (with leasing rates three times lower than the market rate). To date, 103 projects worth more than 2.5 bln. RUB has been approved (cumulative total since 2017).

Twelve projects worth 272.8 mln. The Republic of Tatarstan financed RUB in 2020. Entrepreneurs most often applied to lease equipment for turning and milling; metalworking; gluing; cutting; making semi-finished foodstuffs; vegetable processing; 3D printing; and packaging production[5].

To be eligible for preferential leasing, an entrepreneur must submit several documents that confirm that their business is operational and has potential for expansion, and that leasing can only serve as a measure of financial support. This program meets the requirements of SMEs in the best possible way since it features minimal interest, fast acquisition of leased equipment, and tax breaks. Leasing allows Tatarstan

[3] See Footnote 1.

[4] See Footnote 1.

[5] See Footnote 1.

businesses to efficiently focus their resources on the implementation of advanced technologies and business expansion.

By the end of 2020, the Export Support Center provided consultations to 656 SME members; 621 of those in the framework of the federal project "Small and Medium-sized Entrepreneurship and Support of Individual Entrepreneurial Initiatives." With the assistance of the Export Support Center, 175 SMEs expanded into external markets (94 in 2019, and 81 in 2020). The export contracts of these SMEs totaled 33.24 mln. USD.

In 2020, 55 SMEs participated in the education program of the "School of Export at the Russian Export Center, JSC," organized by the Export Support Center.

Moreover, the regional authorities created the "My Business" Center—a part of the unified body for managing organizations that support SME. This center includes: (1) the Entrepreneurship Support Center, (2) the Multi-functional Center for Business, (3) the Cluster Development Center, and (4) the Center for Social Innovation.

In 2020, the Entrepreneurship Support Center provided more than 25 thousand consultations and hosted 59 events. The Multi-functional Center for Business allows entrepreneurs to use state and municipal services with preferential treatment. This minimizes the time required for entrepreneurs to access information, get services and state support. In 2020, more than 1400 SMEs used the services of the Multi-functional Center; more than 5.3 thousand instances of service were provided. Since 2020, Tatarstan started registering SMEs as social enterprises and compiling a list of such businesses. In 2020, 12 SMEs were added to this list. The Investment Portal of the Republic of Tatarstan features a sub-section "Online Service for Investors" in the "Business Guide" section. This subsection presents an Investment Map with checkboxes for public–private partnerships and SMEs.

SMEs are a key element in the national economy. Therefore, the country needs an effective, stable, and seamless system of supporting these ventures, as well as new incentive mechanisms and financial instruments that would increase the importance of SMEs in the economy (Gegedyush 2016).

4 Conclusion

The efficiency of the market economy is primarily determined by the interaction of a large number of entrepreneurial organizations. At present, state support for entrepreneurial activity is a must, since it is designed to create such economic and legal conditions that would stimulate the development of SMEs (Kormishkina 2018, Zakharov 2016).

The purpose of state support is to create a favorable economic and organizational environment for the development of entrepreneurial activity (Vasilenko 2015). State support for entrepreneurship is the key to the growth of labor productivity. It creates conditions for more productive positive changes in the national economy and supports internal production and economic independence (Ivanov and Korobova 2018).

Currently, entrepreneurship trends towards including SMEs into the digital format of trade. This leads to the increased amount of social entrepreneurs in the Republic of Tatarstan.

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Advanced Innovations in the Field of Sustainable Development and Prospects for Their Development and Implementation on the Basis of Cooperation

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Abstract The paper focuses on the role of innovation as a factor of sustainable development. The authors assess the innovation activity of Russia based on its position in the Global Innovation Index 2020. The accelerated development of digitalization will support innovation in the IT sector. Nowadays, there is a need for increased investment in emerging technologies (e.g., artificial intelligence), which can be applied to the development of drugs and vaccines and the management of related services and resources. Russia sees the unleashing of this potential as a strategic task in the development of the national economy. In this regard, it is necessary to mention the need to stimulate private sector investment in innovation, state support measures for scientific research and development, and the active interaction and cooperation between the government and business. The "Science" project aims to develop the scientific potential of the country, including the expansion of opportunities for scientific and scientific-industrial cooperation. Science has become an integral part of modern society. Any average person understands that any complex problem can be solved only with the help of science, which is intended for this. The social sciences are currently in crisis. This conclusion follows from the fact that society is overflowing with problems—injustice, crises, hostility, terror, aggression, revolutions, coups, and wars. Convincing examples to confirm this statement abound in any sphere of life.

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Keywords Innovation · Innovative development · Sustainable development · Cooperation · Global innovation index · COVID-19 pandemic

1 Introduction

Nowadays, humanity is more often faced with serious global challenges, such as the proliferation of armed conflicts, uncontrolled mass migration, climate change, unintended consequences of scientific progress, growing inequality, and severe infectious diseases. In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development. The Agenda includes 17 goals designed to "end poverty and set the world on a path to peace, prosperity, and opportunity for all on a healthy planet" (United Nations 2020, p. 2).

2 Materials and Methods

Building a sustainable infrastructure, accelerating the pace of comprehensive industrialization, and ensuring its sustainability are crucial to ensuring the introduction of new technologies, increasing the efficient use of resources (especially natural resources), and facilitating international trade since these factors can unleash the necessary competitive economic forces.

The COVID-19 pandemic has caused an unprecedented downturn in the world economy, changing the global context of the Sustainable Development Goals (SDGs). The current crisis hit the innovation sphere at the very moment when it was on the rise.

Globally, R&D spending continued to grow at an extensive pace. R&D spending was $741 billion in 2000, reaching $1.4 trillion by 2010 and $2.2 trillion by 2017 (in terms of purchasing power parity). The investment landscape is gradually shifting from Europe and North America to East and Southeast Asia. The share of these countries in R&D investment increased from 22.6% in 2000 to 40.4% in 2017 (United Nations 2020, p. 43).

Since innovation plays a crucial role in national economic development strategies, it is hoped that it will not suffer as much as forecasted.

Innovative technology and know-how still have great potential, despite the overall negative impact of the global pandemic. On the contrary, the COVID-19 pandemic has indicated the need to increase R&D investment, perhaps even at a higher rate than before. Evidently, to remain competitive, leading companies and investors will not abandon R&D, information systems, and innovation.

The rapid development of digitalization will support innovation in the information technology sector. Nowadays, increased investment is needed in emerging technologies (e.g., artificial intelligence), which can be applied to the development of drugs and vaccines and the management of related services and resources. The increased

interest and demand for R&D in health care will undoubtedly cause an increase in R&D spending in the pharmaceutical and biotechnology sectors. In critical industries such as transportation, there arose the problem of urgent adaptation to new conditions, taking into account the renewed trend towards the search and implementation of green energy sources. The COVID-19 crisis may provide some impetus for creating and implementing innovation in workflow management and traditional industries (e.g., education, retail, and tourism).

Russia sees the unleashing of this potential as a strategic task in the development of the national economy. In this regard, it is necessary to mention the need to stimulate private sector investment in innovation, state support measures for scientific research and development, and the active interaction and cooperation between the government and business.

Russia ranked 47th in the Global Innovation Index 2019. The top ten include Switzerland, Sweden, the USA, the UK, the Netherlands, Denmark, Finland, Singapore, Germany, and South Korea (WIPO 2020, p. 33).

In 2013–2016, Russia significantly improved its position in the ranking and moved from the 62nd to 43rd place in the rating. This growth is caused by the active implementation of state innovation policy in this period. However, there has been a stagnation of innovation activity recently, which can be seen in the absence of significant changes in the position of the country in the rating.

The share of spending on R&D in Russia's GDP fell from 1.1% in 2015 to 1.0% in 2019. Over the same period, the number of researchers (full-time equivalent) decreased by 10.4% (Federal State Statistics Service 2020). Lagging behind the leading countries is traditionally determined by the low efficiency of institutions that form the conditions for entrepreneurial and creative activity.

To reverse these negative trends, the government developed the national project "Science" in 2018. The project is to be implemented in 2018–2024. The project aims to develop the country's scientific potential, including expanding opportunities for scientific and scientific-production cooperation (Government of Russian Federation 2018).

Science has become an integral part of modern society. Any average person understands that any complex problem can be solved only with the help of science, which is intended for this. Convincing examples to support this assertion abound in every sphere of life. For example, the plague was a terrible disaster for humankind. The descriptions of the terrible consequences of the plague can be found in the chronicles of Ancient Egypt. In the fourth century BC, during the heyday of the Eastern Roman Empire under Emperor Justinian, from 532 to 580, the plague devastated all countries of the Mediterranean, killing about 100 million people (almost half of the civilized world). It claimed the lives of approximately 70 million people in the fourteenth century (nearly a third of Europe's population). Nothing could stop the disease, and only science allowed to establish the cause and mechanism of the disease, saving humankind from the plague.

The social sciences are currently in crisis. This conclusion follows from the fact that society is overflowing with problems—injustice, crises, hostility, terror, aggression, revolutions, coups, and wars. The crisis of the social sciences lies not in the

existence of these problems exist. Such a situation for science is quite usual—science always faces problems. The crisis lies in the fact that these problems have existed for thousands of years, and the social sciences do not understand where to look for their solutions. Some scholars believe that human is inherently hostile and aggressive, and, therefore, it is necessary to correct their nature, DNA, and genetics. Others believe that problems are intrinsic to the process of social development and that they facilitate and accelerate progress. Different attitudes to these problems have become common in our lives. It is a usual thing that different political parties and public organizations offer different (sometimes directly opposite) solutions to the same problems. For example, liberals advocate only private property and private enterprise, while left-wing political parties, particularly the Communist Party, advocate only public property and planned social development. This shows only a lack of scientific justification.

In order to understand the situation in the social sciences, let us focus on economic science.

Economic science is the most developed of all social sciences. It has not only fundamental concepts, but also quantitative indicators and a vast arsenal of methods for their analysis (Balalova et al. 2018).

What is wrong with it? As practice has shown, progressive humanity is now evolving in the mainstream of market economics. In fact, not only does economic science not guide the process of social development, but it cannot yet describe it correctly.

The main shortcoming of the existing economic science is that it cannot carry out an objective analysis of economic processes and relations. There are no necessary indicators and methods for this. In order to conduct such an analysis, we need an objective economic measure that is suitable for all stages of economic processes (not just the exchange stage) and all social systems (not just private households).

3 Results and Discussion

As a result of research, the authors have introduced such an economic measure as the product of the generalized state of the object evaluated by the time of its preservation. The generalized state is determined by the amount of information contained in the characteristics of the object or labor in question (Balalova et al. 2018).

Based on an objective economic measure, the indicators necessary for analysis were introduced, the methods for their evaluation were developed, and the objective economic science was created (Balalova et al. 2018).

Objective economic science allows us to consider basic economic ideas in a completely different way and distinguish the cooperative idea. The cooperative idea, which is based on private interests, does not depend on the form of ownership and focuses not only on profits but also on the needs of the people being united, rational use of funds, and equitable income distribution. Cooperatives have proven their

viability under both capitalism and socialism. The cooperative movement is most easily built on objective economic science.

In March 2019, the government approved the program "Scientific and Technological Development of the Russian Federation." This program aims to enrich and realize national scientific potential by achieving the following goals (Government of Russian Federation 2019):

(1) Development of scientific infrastructure;
(2) Identification and development of talents;
(3) Creating conditions for quality professional development of scientific and engineering personnel;
(4) Support for R&D.

It is worth mentioning one of the projects currently being implemented by the Government of the Russian Federation in the field of innovation, namely, the National Technological Initiative (NTI). The implementation of NTI in the conditions of the fourth industrial revolution implies support for enterprises operating in promising technological markets with the highest growth rates, such as (Government of Russian Federation 2016):

(1) Neurotechnology;
(2) Creation of various types of self-driving transport;
(3) Development of small spacecraft;
(4) Intelligent technologies for distributed energy;
(5) New production and medical technologies, etc.

The role of cooperation is increasing due to the COVID-19 crisis, which allows us to combine the potential capabilities of different enterprises.

In a short time in Russia, many agreements have been signed as part of innovative cooperation between pharmaceutical companies, companies producing medical equipment, and developers of emerging technologies.

In order to unite the scientific potential, the Russian companies Sberbank, Gazprom Neft, Yandex, Mail.ru Group, MTS, and the Russian Direct Investment Fund created an alliance in the field of artificial intelligence in November 2019. The alliance started to work on the principle of public–private partnership, supervised by the Ministry of Economic Development. The alliance members expect to accelerate the development of technologies based on artificial intelligence by combining their efforts. The alliance's tasks include overseeing the implementation of the national strategy for the development of artificial intelligence (TASS 2019).

In March 2020, Russia created the Coronavirus Alliance to test the population for COVID-19. It included the Russian Direct Investment Fund, the Russian Union of Industrialists and Entrepreneurs, Yandex, and Mail.ru Group. Later, the leading Russian clinics and laboratories have joined the Coronavirus Alliance. It ensures prompt testing of the population using the best available technology (Interfax 2020).

In April 2020, the largest developers and manufacturers of medical equipment joined together in a consortium. The new association includes the major state corporations KRET, Shvabe, Almaz-Antey, Morinformsystem-Agat, and Tactical Missile

Armament, as well as small private innovative enterprises that develop unique devices (e.g., Triton Electronics). The tasks of the consortium include the creation of a line of domestic equipment for all critical areas (analytical, diagnostic, and therapeutic) based on a single digital platform (TASS 2020a).

In June 2020, R-Pharm and Japanese corporation Canon Medical Systems announced the creation of a joint venture, RP Canon Medical Systems LLC, in Moscow to distribute and service medical equipment with the prospect of localizing production in 2021. It is assumed that the company will operate not only in Russia, but also in Azerbaijan, Armenia, Tajikistan, Turkmenistan, Uzbekistan, Kazakhstan, Kyrgyzstan, and the Republic of Belarus. The prospect of this project lies in the possibility of uninterrupted provision of advanced medical equipment to health care institutions, in particular within the framework of the national project "Health Care" (TASS 2020b).

4 Conclusion

Innovation and scientific research are fundamental to long-term economic development. The COVID-19 crisis has led to a decline in economic activity and, consequently, to the redaction of funding sources. Current conditions necessitate the need to improve the measures and mechanisms of state support for R&D and innovation activities, especially for small and medium-sized businesses.

The barriers created by the pandemic have become a real threat to the development of globalization and effective international cooperation. Despite restrictive measures, collaborative research and development aimed at solving medical problems in a pandemic have shown how promising international cooperation and collaboration can be.

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Development of Rural Cooperation as a Basic Element of Their Sustainable Development

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Abstract The purpose of this work is to assess the impact of cooperation on sustainable rural development. At the same time, the part of the cooperative movement that relates to consumer cooperation is studied with special attention to the formation and development of agricultural consumer cooperation. Sustainable rural development should be seen as a result of the sustainable development of all economic entities operating in the territory, especially small forms of land and household management. Without denying the need to take into account the economic, social and environmental aspects of development in sustainable development, the research uses a methodology to analyze the positive impact of cooperation on the main groups of factors on which the level of sustainability of rural development depends. A comparative analysis of comparative statistical materials characterizing some factors that increase the sustainability of rural development in Finland (as a country with developed agricultural cooperation) and Russia, which takes only the first steps towards the revival of its cooperative system, is used as a justification for the conclusions and recommendations. The results of the study suggest that small forms of rural farming combined on the basis of cooperation are subject to cyclical fluctuations in the economy and face the same global economic, environmental, demographic and social problems as uncooperated entities. However, the impact of these negative processes is significantly weakened by exploiting the potential of cooperation. An interim result of the research is that the enlargement of the cooperative system, its vertical integration and access to global markets can lead on the one hand to an increase in the influence of the cooperative and its integration into the global system

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of economic relations, but also to a decrease in the ability to take into account the interests of its members in economic decision-making.

Keywords Cooperation · Sustainable development · Agricultural production · Rural areas · Ecology

JEL Codes O1 · Q1 · J0

1 Introduction

The impact of cooperation on the sustainable development of territories should be considered on the basis of the interaction of theories of cooperative systems and sustainable development systems. Within the framework of this work, we build on the understanding of cooperation as a tool for consolidating the efforts of economically independent actors to solve their common problems. The research will therefore focus on consumer cooperatives, especially agricultural consumer cooperatives, which play a key role in rural development.

The foundations of the theory of consumer cooperation were laid by William King in England, as the development of the ideas of R. Owen and S. Fourier (Palladina and Voronina 2014). Today, the theory and practice of the development of cooperatives in general and consumer cooperatives in particular have made it possible to form the basic principles of cooperatives, the mechanisms for their creation and development, and to distinguish the distinctive features of cooperatives from other forms of organization of socio-economic activities. In recent years, studies of cooperation have been conducted to assess their adaptation and resilience to the challenges posed by the processes of concentration of capital, globalization of economic life, reduction and high volatility of agricultural prices, etc. (Bazarov et al. 2021; Briggeman et al. 2016; Grashuis 2018). Almost all foreign authors note trends in the enlargement, merger and vertical integration of agricultural cooperatives, as well as their active search for mechanisms for entering international markets. Nevertheless, there are practically no articles in the scientific literature that would assess the potential of the cooperative system for the sustainable development of territories.

Based on this, the purpose of this work will be to assess the impact of cooperation on the sustainability of rural development. The theoristic potential of the impact of cooperation on sustainable development needs to be explored. After that, some statistics will be given showing the positive effects of the cooperative movement on strengthening the sustainability of the development of territories and the problematic areas of strengthening this influence.

2 Methodology

The theory of sustainable development was formed under the influence of the ideas of Meadows (1972) and at first was based only on the provision on the need to maintain an environmental balance in the development of people's economic activities. Further, the theory was based on the triad of sustainable development within the framework of the mutual influence of social (sometimes separately political), economic and environmental spheres of society's activity and its impact on nature (Turner et al. 2020; Ostrom 2009). After that, the ideas of sustainable development began to spread from the global level to the level of individual territories and even individual economic entities (Prokopenko 2014; Hendrickson et al. 2008). Some authors, developing the ideas of sustainable development, propose to create complex theories of using individual constituent elements of resource potential, for example, on the need to form a general theory of land use (Turner et al. 2020). Developments within the framework of the theory of sustainable development follow the path of highlighting its significant elements or factors, the study of which, first individually, and then in interconnection, will create models and develop mechanisms for achieving sustainable development. So Ostrom (2009) forms a multi-level structure for the analysis of complex socio-ecological systems (SES) in the framework of which they form groups of variables that characterize each subsystem and which are available for research. The study (Clark and Harley 2020) identifies six opportunities, exploring and managing which can increase the effectiveness of activities in the field of ensuring the sustainability of the development of the system.

Not deminishing the merits of these approaches in terms of developing a methodology for the research of sustainable development processes, one cannot ignore their problem areas. Unfortunately, these models do not reveal the essential directions of sustainable development, but rather form a set of tools and factors. But without understanding the necessary direction of activity, these factors and tools are useless. For example, innovation or lobbying for groups with a consolidated interest are clearly important elements of sustainable development. However, it is not clear in which direction we should use them to increase the stability of systems. Therefore, when assessing the impact of cooperation on sustainable development, we will build on the existence of the basic elements of sustainable development that reveal the characteristics of the developing system that ensure its sustainability. These include:

(1) basic development goals;
(2) the capacity of the system, its development and use;
(3) maintaining the socio-economic and social balance of the system, including the balance of the system with the external environment and the internal balance of individual elements of the system;
(4) special mechanisms for maintaining the sustainability of development (costs of sustainability).

Clark and Harley (2020) has noted the importance and challenges of defining sustainable development goals. Of course, development goals may be different, but

they should not contradict other basic elements of sustainable development. For example, the goal cannot be to waste the potential of a system without simultaneously accumulating it. A more or less general goal of sustainable development at the global level can be called the goal of improving the well-being of the current generation without reducing the possibilities for maintaining and growing the well-being of future generations. But naturally, at the level of individual territories, this common goal needs to be specified taking into account the conditions for the development of a particular country (region). At the same time, the significance of the goal lies primarily in the fact that it allows us to assess whether the system is developing or not. Since in the absence of a goal, the term "development" itself loses its meaning and simply turns into "change."

The following three pillars not only achieve the objective but also maintain and build the sustainability of the process. Without capacity, development is not possible, but waste of capacity limits the sustainability of the system, so for truly sustainable development it is necessary to combine utilization and capacity-building processes.

Balances inside and outside the system are necessary to prevent the accumulation of contradictions, which at a certain point in time can lead to the impossibility of further development, and sometimes to regression.

The cost of sustainable development is also a mandatory element and consists in the cost of forming reserve funds, strategic investments, the cost of maintaining balance of interests, trade-offs, the use of compensation mechanisms and other similar costs, the need to obtain a safety margin in a developing system.

The assessment of the role of consumer cooperation in increasing the sustainability of the development of territories should be based on the structure of the basic elements proposed above and characterize the possibilities of cooperation in developing the potential of the territory, maintaining a balance in the development of the system and protective mechanisms for ensuring sustainability. At the same time, based on the theory of cooperation, it is obvious that consumer cooperatives are necessary primarily to consolidate the efforts of either the rural population or small forms of rural management. After all, consumer cooperation allows us to solve a wide range of problems related to auxiliary activities serving the main production by peasant farms and to organize joint provision of benefits to the population. Large business entities, by obtaining effects from the scale of the activity, usually do not need cooperation of this type, but use the tools of cooperation in its wider definition. Based on this, the role of cooperation in the sustainable development of territories can be assessed only if this development requires the presence of small forms of rural management. Small forms of management cannot develop steadily without cooperation, but in themselves it is these forms of management in the form of peasant farms, family estates, eco-settlements and others that can also ensure the sustainable development of rural areas (Chekmarev 2019).

Some aspects of the problem under study are considered in the works of: Meadows et al. (1972) and Ostrom (2011).

The authors also used the materials from The Eurasian Economic Commission (Eurasian Economic Commission 2020) in this article.

3 Results

The theoretic conclusions on the potential of consumer cooperation in ensuring the sustainability of the development of territories are given in Table 1.

Let's explain the contents of this table. First of all, the goals of the cooperative are goals shared and supported by all its members and are usually aimed at increasing well-being in the long term, which correlates with the goals of sustainable development as a whole. Such target settings in cooperatives are formed due to the very essence of the cooperative movement. Unlike business structures, a cooperative cannot have an individually significant or selfish goal, since the ownership of the cooperative and the ability to influence its policy are evenly distributed among all its members. As a result, cooperatives are far more likely than other economic actors to have goals that are at least not contrary to, but often coincidental with, sustainable development goals.

Consumer cooperatives contribute to the accumulation and better utilization of the potential of cooperative members. Membership in a cooperative leads to an increase in social capital in society, allows you to accumulate resources, save on production

Table 1 Impact of consumer cooperation on the sustainability of territory development

No.	Basic element of sustainable development	Characteristics of the consumer cooperative affecting the formation of the basic element
1	Basic development goals	Correlation between cooperative goals and sustainable development goals
2	System capacity, capacity-building and utilization	Accumulation of resources of cooperative members, growth of social capital. cost savings, increased revenue, increased demand for products
3	Maintaining the socio-economic and social balance of the system: Balance of the system with the external environment	Strengthening market position Smoothing price disparity Taking into account the interests of the population Incentives for environmental safety Balance of public and private interests
4	Internal balance of individual elements of the system	Replacing competition with partnership or solidarity "One member—one vote" principle Reduced information asymmetry Improved process control Growing trust among cooperative members
5	Special mechanisms to maintain sustainable development	Cooperative reserve funds Collegial forms of problem solving Mutual assistance between members Possibility of activity planning

Source Complied by the authors

costs, and increase income from the sale of goods. The reasons for these opportunities are based on the fact that consumer cooperatives essentially remove intermediary links in the supply, processing and marketing routes of products, and make it possible to obtain effects from the scale of activities. In fact, these intermediary links become the property of consumer cooperatives of certain types, and therefore the property of its members, which makes it possible to significantly increase the profitability of activities. In addition, due to the possibility of lowering prices for goods while maintaining the given profitability of sales and consolidating volumes, conditions are created within the framework of consumer cooperation for increasing the volume of raw materials and expanding market boundaries. All this contributes to the development of the capacity of both the individual members of the cooperative and the respective territory, which is an essential factor in their sustainable development.

Cooperation of small forms of management allows to smooth out multiple imbalances that arise at the level of interaction of these forms with other economic entities. Among them are opportunities to strengthen the market position of small agricultural producers in the field of supply and marketing, which contribute to reducing the severity of the problem of price disparity. The need to work in a coherent manner within the cooperative has contributed to striking a balance between private and public interests. Since, in the vast majority of cases, members of first-level agricultural consumer cooperatives are living and functioning on the same territory, these cooperatives take much better account of the interests of the population of the territory where the cooperative is located and give rise to incentives for environmental safety of production. It is no coincidence that leading cooperatives set themselves the tasks of environmental content. For example, Organic Valley, an American cooperative of organic producers, uniting about 1800 farmers, is becoming the largest food company in the world that is completely switching to the use of electricity from renewable sources. It is clear that in moving towards greening, many cooperatives solve parallel problems, for example, by forming an appropriate marketing strategy. But it is also clear that the interest of all members of the cooperative, whose production and place of residence are in close proximity to each other, is more pronounced in their desire to protect the environment, whereof, the urban population.

Within the cooperative, conditions are also created for balancing the interests of their members and through management and property differentiation of members. If in commercial structures management is concentrated in the hands of the main owner of capital, which leads to the development of the potential for discrimination of some owners by others, then in cooperatives, due to the principles of decision (“one member—one vote”) and openness to the activities of members of the cooperative, conditions are created for balancing the opportunities of members of the cooperative to influence decisions on its functioning. The cooperative develops a spirit of partnership and sometimes solidarity, which is more appropriate to the basic elements of sustainable development in the types of relations, as opposed to, for example, competitive relations.

4 Discussion

We tried to compare the development trends of rural areas in Finland and Russia, as countries with extremely different levels of cooperation development. If in Finland the cooperative system is extremely developed and unites the vast majority of agricultural producers in the country, then the coverage of the Russian rural population by cooperation, and even less so by small forms of management, is extremely small.

However, even the initial comparison of some aggregated indicators characterizing the sustainability of the development of the territories led to mixed conclusions. Therefore, a comparison of the level of urbanization, as well as the proportion of the rural population working in agriculture, showed that the level of urbanization in Finland is even higher than in Russia, and in the second indicator the countries practically do not differ from each other. Thus, it is difficult to conclude that agricultural cooperation contributes to the consolidation of the population in rural areas. Moreover, in Finland there is an annual decline in the number of farms, while at the same time they are enlarged. If in 2000 the total number of member farms of the Valio cooperative was 17 thousand with an average herd of 16 cows, then in 2019 the farms were already only 4700 units, and the number of heads increased to 43 (Valio Official site 2020). Thus, cooperation cannot completely offset negative socio-economic processes in society and is strongly influenced by demographic and globalization factors.

However, some data suggest that cooperatives are creating conditions to enhance the sustainability of the development of its members, and with them the rural area as a whole. Table 2 shows some data describing the income of milk producers in Russia and Finland. For Finland, data are given for two cooperatives (Valio with 4700 members and Maitokolmio with 105 members).

The data placed in the table requires some explanation. In Russia, data on the ratio of payments to agricultural organizations for milk and the revenue of dairy plants are not published. Therefore, to compare with Finnish statistics, the ratio of the average sale price of one liter of milk by agricultural organizations to the sale price of one

Table 2 Income remaining at the disposal of agricultural milk producers in Russia and Finland

No	Indicator	2015	2016	2017	2018	2019
1	Ratio of milk fee to revenue, Maitokolmio cooperative.%	46.24	51.96	43.4	45.69	46.03
2	Ratio of milk fee to revenue, Valio cooperative.%	43.07	43.71	42.45	41.63	40.40
3	Ratio of consumer prices for milk with drinking fat content 2.5–3.2% to the sale price of milk by agricultural organizations in Russia in %, taking into account correction for milk fat content (correction of consumer prices by 15%)	38.92 (2014)	36.85	39.86	36.78	37.50

Source Rosstat Official website (2020), Valio Official site (2020), Maitokolmio Official site (2020)

liter of milk 2.5–3.2% of the fat content in the retail market was taken. At the same time, an adjustment was made for the difference in the fat content of milk, which is sold in the retail chain and supplied by milk producers. For comparison, it was possible to take the price of milk sales by dairy plants, but this is not the same as Finnish indicators, in which revenue is generated not only from the sale of milk, but also dairy products with greater added value. In addition, comparison of retail milk prices in Finland with the average revenue of a cooperative dairy plant per liter of milk purchased from farmers shows that they are almost the same. So the price of one liter of milk in the Prism retail chain is about 1 Euro/liter, which is almost equal to the revenue per liter of milk in the Valio cooperative.

This is a sharp contrast to price ratios in Russia. For example, the price of milk from an agricultural producer in 2019 was 24.88 rubles/liter, when selling drinking milk from a dairy plant—41.67 rubles/liter, and in retail the price was already 57.70 rubles/liter of milk 2.5–3.2% fat. Therefore, it can be seen that in the absence of cooperation, the relative price of milk sales increases, which limits the demand for this product and reduces the potential for sustainable development of agricultural producers.

Table 2 shows that in Finland, farmers have a higher share of the price of milk than in un-cooperated Russia. Therefore, the advantage of a consumer cooperative is justified by the fact that, as a non-profit organization, it stands to protect the interests of its members and increases the purchase price of milk for them, which provides farmers with additional profit and a corresponding increase in sustainability. It is also noteworthy that the smaller cooperative of Finland (Maitokolmio). Directs to payments to farmers are a slightly larger part of its revenue than Valio, which confirms the thesis noted by Grashuis (2018) that when enlarged, cooperatives may face problems of collective choice, weakening social capital.

5 Conclusion

Summing up this work, the following main conclusions and provisions can be discussed.

1. Due to the peculiarities of its institutional structure and cooperative principles, consumer cooperation creates wide opportunities for the formation of the basic elements of sustainable development of the territories. At the same time, the best results can be achieved when forming a multi-level cooperative system of the region, when wide segments of the population and small forms of rural management are included in it.
2. The reality shows that cooperatives cannot guarantee the elimination of all the negative consequences of crisis events in markets and in the economy as a whole; they cannot completely offset the impact of negative demographic and global effects. But at the same time, they have the ability to smooth out these effects,

provide members of cooperatives with time to adapt to changing environmental conditions.

3. The general trends in the development of modern markets based on capital concentration and vertical integration cause cooperatives to try to adapt to them, but an attempt to copy models characteristic of a competitive business environment can lead to a weakening of the ability of cooperatives to provide conditions for truly sustainable development.

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The Role of Cooperative Environmental Entrepreneurship in a Socially Oriented Society

Evgenija E. Ostrojnaya, Elena V. Feshina, Irina V. Zimina, Nataliya B. Yakusheva, and Tatiana O. Efimova

Abstract The purpose of the research is to consider the causes of environmental pollution in the Krasnodar Territory of Russia and the role of the use of cooperative environmental entrepreneurship to solve the issues of taking into account the long-term environmental consequences of current environmental decisions in a socially oriented society.

Keywords Anthropogenic pollution · Environment · Reducents · Cooperatives · Environmental and economic direction · Sustainable development · Environmental equipment

JEL codes J 54

1 Introduction

The relationship between man and nature has always been interested in scientists, poets, artists. The environment is a source of benefits and habitat for living organisms. Man, as part of nature, can produce products for life, using its resources, as well as live in the troposphere with certain climatic conditions. It takes resources from nature, energy for granted in the quantities it needs and pollutes the environment. Nature

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doesn't like to be offended. She takes revenge on abusers—crop failures, volcanic eruptions, floods and other natural disasters. This creates environmental problems for humanity.

Due to the fact that environmental problems need to be solved, and they can be solved through the introduction of new environmental technologies and the use of environmental protection equipment.

In Russia, the environmental sector was financed by the state. Due to the international economic crisis, funding has decreased. Due to a significant decrease in public financing for the environmental sector, some enterprises producing environmental equipment and developing environmental technologies have closed. This led to an increase in environmental pollution, there was a need to search for other facilities that can correct the situation. These enterprises should not be state-owned, should be communicable, but have a different form of financing. These may be private or cooperative enterprises. In our opinion, such enterprises can be cooperatives as part of environmental entrepreneurship. These enterprises should have a role in enabling them to address environmental protection issues in a socially oriented society. Therefore, the topic of our research "The role of cooperative environmental entrepreneurship in a socially oriented society" is relevant.

The purpose of the studies is to consider the causes of environmental pollution in the Krasnodar Territory of Russia and the role of the use of cooperative environmental entrepreneurship to solve issues of accounting for environmental pollution in order to assess the long-term environmental consequences of current environmental decisions in a socially oriented society.

The main tasks of the research are:

- To identify the sources of environmental pollution; to identify their causes and the impact of environmental degradation in the regions under research on the quality of the environment;
- To prove the possibility of eliminating environmental pollution and improving the environmental situation through the use of environmental protection equipment and technologies created by cooperative environmental entrepreneurship;
- To explain the role of cooperative environmental entrepreneurship in creating favourable environmental conditions for living in a socially oriented society.

2 Materials and Methods

The methodology of the research consisted in collecting the results of qualitative indicators of anthropogenic environmental pollution of the Krasnodar Territory before 1991 (1988–1990) and after 1991 (1991–2005), statistical processing of data, identifying the reasons for the deterioration of the environmental situation and issuing proposals for improving the environmental condition in the regions under study through the organization of cooperatives that can create environmental-protective technologies. And environmental equipment. The following methods of research were used: statistical, comparative, logical, specific-territorial and others.

The methodology consisted of collecting the results of qualitative indicators of anthropogenic pollution of the environment of the Krasnodar Territory before 1991 and after 1991, statistical processing of data, identifying the reasons for the deterioration of the environmental situation and issuing proposals for improving the environmental condition in the regions under study.

3 Literature Review

The ecological situation in Russia is favorable for living organisms in not all regions.

The state is not able to solve environmental problems to improve the environmental situation, as it has reduced public funding for environmental needs. Based on the studies carried out, it is proposed to solve the problems of improving the environmental situation and creating favorable living conditions for living organisms can be partially or completely, with the help of cooperative environmental entrepreneurship. To this end, it is necessary to create cooperative organizations, to stimulate the work of these newly created cooperatives engaged in environmental entrepreneurship.

State enterprises producing environmental equipment are bulky, difficult to manage. They take a lot of time from the decision to the implementation.

Environmental entrepreneurship cannot include all enterprises that produce equipment for environmental purposes. The authors of the article agree with the opinion of Boboshko, Gusev, Potravny that environmental entrepreneurship should include those enterprises that meet the following criteria (Boboshko et al. 2006):

- The existence of the Charter, which specifies the purpose of the production of environmental protection equipment and the development of environmental technologies;
- Possibility of execution of state and municipal order programs on works and services aimed at cleaning of discharges and emissions of industrial enterprises into the environment;
- Development of technologies and equipment that address the need not only for environmental clean-up but also for the restoration of depleted natural resources;
- Specific weight of environmental works shall not be less than 75% of the total volume of production.

To regulate the activities of newly created environmental cooperatives, economic methods of regulating activities in the field of environmental management and protection of the environment can be used, proposed by Bondarenko (2005).

Without them, it is impossible to eliminate the harmful shortcomings caused by the imbalance in the combination of the economic, social and environmental components of development, which led to contradictions between the living needs of the population of the regions and the destruction of ecosystems, environmental degradation (Varennikova 2017).

The EU European Commission documents state that environmental entrepreneurship must provide services to identify harmful substances, produce goods that help

eliminate or limit environmental harm, and develop environmental-restrictive technologies that help eliminate or minimize environmental pollution with minimal rational use of natural resources[1].

In a socially oriented society, in order to ensure favorable living conditions for living organisms, preserve their health and extend their life, the role of cooperative environmental entrepreneurship is to design and produce environmental protective equipment, create new environmental technologies that can reduce or minimize (bring to the established maximum permissible standards) environmental pollution.

According to Ershova, for this it is necessary to study the market of already existing environmental services in order to implement proposals on their use to stabilize the state of the environment, rational use of natural resources, which will increase environmental safety and lead to the preservation of public health (Ershova et al. 2015).

Zlobin in work suggests that cooperative environmental entrepreneurship should be understood as the statutory activities of cooperative organizations and enterprises that are aimed at protecting the environment (Zlobin 2011).

Such activities can be organized through the design, creation and production of products, the introduction of environmental protection technologies and equipment, the performance of work and the provision of services that help to ensure compliance with current environmental requirements and standards.

The country must overcome the reduction crisis, that is, emissions to the environment and discharges of various types into soil and water must be reduced to the amount that can be processed and continue to develop sustainably. Sustainable development is to meet the needs of society without endangering health.

Environmental problems of different regions are summed up and lead to global changes in the state of the biosphere. Global change is not simple. They are related to politics (when the economy is placed above ecology), demography, economics (to achieve maximum profits by any means, even through environmental pollution, and deterioration of public health), ecology and the level of development of new environmental and protective technologies. Environmental problems have a negative impact on the quality of life of living organisms and on the development of socio-economic systems, including cooperatives.

We live in a socio-economic society. It must develop sustainably, but environmental problems prevent it. Environmental business should help society cope with environmental problems. It is capable of ensuring not only economic but also environmental responsibility for the state of the environment.

There is the UN Global Compact, which sets out the universal principles of enterprise development[2].

[1] EU European Commission. Environmental Management. Electronic Resource. Access mode: http://ec.europa.eu/dgs/environment/index_en.htm

[2] UN Commission on Sustainable Development. E-resource. Access regime: www.un/org/en/development/sustainable/csd/shtml

The third part of the universal principles in the Global Compact are environmental. They concern environmental entrepreneurship. It is true that it does not indicate which enterprises or organizations should engage in environmental entrepreneurship.

In order to solve environmental problems, a preventive approach must be taken (easier to prevent than treat). It will prevent the danger of pollution and force the use of environmental equipment and technologies to avoid pollution and deterioration of the health of residents of contaminated territories.

Exceeding the maximum permissible standards of anthropogenic pollutants is an environmental offense for which the punishment must be increased.

Mitrofanova writes in work that it is necessary to introduce proposals aimed at increasing responsibility for environmental offenses related to environmental pollution, to promote the development and dissemination of new environmentally sound environmental technologies (Mitrofanova 2013).

The term "environmental entrepreneurship" has long been known, but not all researchers and practitioners dealing with environmental issues understand it equally. Most mean environmental entrepreneurship—activities for the production, sale of goods, the implementation of works and services aimed at preventing and reducing harm to the environment and public health. It is the most important direction of ensuring favorable living conditions of living organisms in the biosphere (Mikhailova 2017).

In spite of the fact that cooperative business is independent business, the state doesn't finance it, but activity of ecological business has to be based and stimulated with the state because creation of the environmental-protective equipment and devices is very energy-intensive and expensive direction. Unpunished environmental pollution, irrational use of natural resources leads to unstable development. The state, in our opinion, has to toughen the measures called for fight against ecological offenses that will force the enterprises pollutants of the environment to buy the environmental-protective equipment and technologies. Acceptance of such measures will become an additional incentive of development of ecological business in the cooperative organizations and the enterprises.

Work of the enterprises of ecological business taking into account their specifics of work needs to be stimulated. As an incentive it is possible to offer, for example, release of these enterprises partially or completely for some term from payment of income taxes, the customs duties or value added. It will create additional motivation of work to the enterprises of ecological business taking into account an economic and financial situation in the country (Naumov 2017).

It isn't favorable to the state. However, it is impossible to allow further uncontrolled environmental pollution, knowing about the impossibility of restriction of scales of economic activity as a main goal of businessmen is receiving the maximum profit.

Development of rational ways of interaction of users of nature with the environment can be an effective exit in a similar situation. Most likely, rationing of the quality of the environment can serve as one of such ways. It means that it is necessary

to increase economic indicators of economic activity with respect for maximum-permissible norms of the pollution and emissions in the environment guaranteeing environmental safety of the person and preservation of genetic fund.

Such relation to environmental protection will indirectly provide rational use of natural wealth without prejudice to resource balance and their reproduction in the conditions of effective managing (Ostrojnaya 2014).

It is known that the maximum profit is the purpose of activity of any business, but it needs to try to be reached with obligatory accounting of social and economic and ecological factors (Popkov 2007).

Polluting the environmental waste of the production and economic activity, mankind gave itself on a side of environmental disaster. It put economic production and economic benefits above ecological wellbeing, having created environmental problems for the account over standard environmental pollution. Shaposhnikov, offers the list of questions on conservation, Rodionov, Klushin and Torocheshnikov offer technology of environment protection (Rodionov 2016).

In our opinion, cooperatives are mobile socio-economic systems that quickly adapt to the current situation of a socially oriented human society, are being rebuilt to fulfill the set situational tasks and introduce them into production, which will contribute to the preservation of the conditions for the sustainable development of society. They are designed to eliminate inconsistencies during the formation of a market economy. As Teplov wrote. "Cooperation originally arose as a socio-economic mechanism for regulating contradictions and inevitable expenses of a market economy" (Teplov 2005).

Currently, all residents of the regions of the Krasnodar Territory and planet Earth studied by us as a whole live in an environmental crisis of reducents. Polluted water bodies, atmosphere, soil. Reducents (natural decomposers, destructors) do not have time to decompose all harmful substances that are dumped into the environment by the population, industrial enterprises. They accumulate in all parts of ecological systems, poisoning and clogging them. Ecological systems degrade, partially degrade or disappear completely.

It is impossible to stop the development of scientific and technological progress in the field of technological and technological processes of production, as well as it is impossible to completely clean the already polluted and newly polluted environment. Each new open industrial enterprise is a pollutant of the environment unless it uses environmental technologies or environmental protection equipment.

Further development of any production enterprises leads not only to mechanical pollution, but also to chemical, physical (thermal, light, noise, radioactive, electromagnetic, etc.), biological and others. Conditions are created for the creation of an imbalance between the socio-economic and environmental areas of life of a socially oriented human society. Therefore, the main task of our time is to create and maintain a balanced development of these areas.

The main object that can solve this problem, in our opinion, is the organization of cooperative environmental entrepreneurship. If this object is created to create favourable living conditions, it will contribute to the reduction of both anthropogenic and natural pollution, to overcoming the ecological crisis of reducents, to the rational

use of natural and artificially created resources, and will lead to a transition to a path of sustainable social and environmental-economic development.

4 Results

The results of studies showed that after the state reduced funding for the environmental sector, the state of the environment deteriorated, as due to lack of funding, many enterprises producing environmental equipment closed.

Studies have shown that it is currently impossible to focus on maximizing profits by any means, since this path will not lead to a reduction in anthropogenic pollution of the environment and the creation of favorable living conditions for humans and other living organisms.

The need to return enterprises creating environmental equipment and new technologies for cleaning the biosphere was established. Therefore, the most important task of today is the creation of new organizations and enterprises whose work will be aimed at the development of environmental technologies and equipment, ensuring environmental safety and the rational use of natural and artificially created resources. The solution of complex environmental problems in social and economic society can be solved not by state, but by cooperative organizations of environmental entrepreneurship.

5 Discussion

Ecological entrepreneurship with state financing of the ecological sphere in Russia developed from 1988 to 1991. It consisted in the introduction of waste-free, low-waste technologies, the use of renewable energy sources and the production of environmental equipment for cleaning air emissions, as well as discharging harmful substances into soil and reservoirs.

In 1991, there was a decrease in public financing of the environmental sphere, which led to the liquidation of enterprises and organizations that provided environmental protection activities, the creation of technologies and equipment for low-waste and waste-free technologies. The closure resulted in a decline in public funding. After the closure of enterprises producing environmental equipment, working industrial enterprises did not have the opportunity to clean emissions and discharges of harmful substances. The disappearance of environmental equipment and technologies has contributed to a significant deterioration in the environmental situation and an increase in anthropogenic pollution of the environment. A contaminated environment is detrimental to the health of living organisms. Nature protection will lead to a decrease in anthropogenic load and an improvement in the state of the environment. Protection of the natural environment should be given special attention, development of events, application of environmental technologies and equipment, which

will contribute to the reduction of morbidity and life extension of living organisms (Shaposhnikov 2015).

In order to discuss the results of research, it can be said that at present there is an urgent need to expand the environmental business through the creation of cooperative enterprises and environmental entrepreneurship organizations.

6 Conclusions

Based on the results of the research, it was proposed to resume the production of environmental equipment and the development of environmental technologies not at the expense of state enterprises, but through the involvement of cooperative environmental entrepreneurship. Environmental cooperatives will create equipment, instruments and technologies to clean up harmful emissions and discharges into the biosphere.

It is impossible to stop the development of scientific and technological progress in the field of technical and technological processes of production, as well as it is impossible to completely clean the contaminated and polluted environment. Environmental cooperatives are the best target for addressing the linkages between environmental and economic harm. They are more mobile than the state, can quickly rebuild work according to the created situational conditions and produce environmental equipment for cleaning the environment.

Based on the results of our studies, we can conclude that:

- Due to a decrease in state financing of environmental problems, pollution of the environment of the Krasnodar Territory of Russia increased due to the closure of enterprises producing environmental equipment and developing environmental protection technologies;
- New enterprises should be established to produce environmental equipment that will not be financed by the State;
- Environmental business in the form of cooperatives of environmental entrepreneurship is the best object for environmental protection;
- Currently, environmental problems are very aggravated and lead to a violation of sustainable development, so environmental entrepreneurship is in great demand, therefore, the work we have done is very relevant.

The results of our research have shown the urgent need to expand environmental business through the creation of cooperative environmental entrepreneurship.

Environmental cooperatives should create a market for environmental goods and services, organize economic, social and environmental organizational events that will lead to the harmonization of economic and environmental needs of a socially oriented society.

Our research is ongoing. The results are presented in only one region—the Krasnodar Territory of Russia. Work continues on the study of scientific, methodological, theoretical and practical methods for the study of cooperative environmental

entrepreneurship as a factor in the development of modern organizations and enterprises, taking into account the current environmental situation in socially oriented societies in various regions of the country.

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Ensuring Sustainable Enterprise Development in the Context of the Systemic Crisis of the Global Transformation of Society

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Abstract The purpose of the research is to identify the essential and variable-reproducing properties (features) of entrepreneurship for the development on this basis of recommendations for ensuring its sustainable development in the context of the systemic crisis of the global transformation of society. The analysis showed that at this stage, entrepreneurship (like all other fundamental elements and spheres of economic activity) is undergoing drastic changes, primarily from an organizational and managerial perspective. This raises a set of issues on which this publication focuses attention. First of all, we are talking about the emergence and formation of a fundamentally new lifestyle, which causes significant changes in the structure of people's needs, which must be taken into account when developing recommendations for the further development of entrepreneurship. As a result of the research, the original author's concept of the national-state guiding and regulatory influence on entrepreneurship is presented in the context of the systemic crisis of the global transformation of society and the transition of human civilization to a fundamentally new stage of historical development. This demonstrates scientific novelty and is a definite scientific contribution to the solution of the problem under consideration.

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Keywords Entrepreneurship · People · State · Regulation · Organization · Management · Market · Crisis · Globalization · System · Sustainable development · Reproduction

JEL Codes P13

1 Introduction

Human civilization is in a turning point in its development, which is accompanied by a systemic crisis, not only of the economy, but also of the ecology of man, nature, and society (Larionov 2019). At the same time, the intensity, respectively, and speed of the socio-historical process increases exponentially, which is evident, in particular, in processes such as the rapidly growing digitalization of not only the economy, but also the entire sphere of social communications.

A particular role in the systemic crisis has been played by the pandemic of KV-19, which has taken on threatening forms, and this fundamentally undermines global economic sectors such as international tourism and passenger transport, leading to the massive bankruptcy of these and other entrepreneurial structures in all countries of the world. KV-19 quickly, rapidly, and also radically changed the way of life of a person in all countries of the world. And no matter how events unfold in the future about this and other possible epidemics, a return to the previous way of life, which has already become severely eroded during the global systemic crisis, seems impossible. On the agenda is the issue of the emergence, formation and development of a fundamentally new way of life, its new quality (Yekhlakova 2020). And this is followed by the corresponding cardinal changes in the structure of the needs of individuals and society (Zhukova and Larionova 2019). All of the above have a very significant impact on entrepreneurship.

In this situation, entrepreneurship needs to be radically restructured, changing the algorithms of activity in order to turn into the most important element of the economy, which organically fits into its systemically forming framework.

2 Materials and Methods

The theoretical and methodological basis of the study is the works of domestic and foreign scientists, reviews of periodicals, monographs and articles in specialized publications, analytical developments, statistical and reference materials on the problem under consideration. During the study, general scientific methods of theoretical and empirical cognition were widely used: analysis and synthesis, analogy, comparisons and classifications, logical constructions, and system analysis of management decisions.

This study is based on works such as: Mityushina et al. (2017), Nabiyeva (2021), Matraeva et al. (2018) and Babakaev et al. (2018).

The authors also used the materials from STATE AND LAW: Security and Anti-Corruption (Larionova et al. 2020) in this study.

3 Results

The authors developed a classification matrix of essential and variable-reproducible properties (features) of entrepreneurship (Fig. 1).

Designations:

IN—initiative;
IV—innovation (innovation);
IA—independent activity, with taking responsibility and risk;
AK—activity in kind;
MMA—money-mediated activities;
AMD—activities mediated by digitalization;
VE—valid entrepreneurship;
IE—imitation entrepreneurship (self-interest, disguised as entrepreneurship, including especially in the form of bluff innovations);
SUE—socially useful entrepreneurship;

Essential characteristics / Variable-Reproducible Features	IN	IV	IA	AK	MMA	AMD
VE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
IE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
EHS	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
OE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
OE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
SE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
LFE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD
LUE	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD	SRAWINCCD

Fig. 1 Classification matrix of essential and variable-reproducing characteristics of entrepreneurship. *Source* Complied by the authors

EHS—entrepreneurship harmful to society;
OE—open entrepreneurship;
SE—shadow entrepreneurship;
LFE—legally formalized entrepreneurship;
LUE—a legally unformed enterprise;
SRAWINCCD—a set of reproduction activities, which includes a number of components indicated with the corresponding decoding below:
SPMSSR—spheres-processes of a multidimensional system of social reproduction;
LASMLPR—levels and sublevels of a multi-level system of public reproduction;
EIMLSPR—enlarged industries of a multi-level system of public reproduction;
DSE—different scale of entrepreneurship;
SEFE—socio-economic forms of entrepreneurship;
CEFE—completeness of essential features of entrepreneurship.

The following are structural formulas that reveal the set of elements included in each component of the HPAC (reproductive activity complex):

$$\textbf{SSPLSPR} = \text{SPP} \leftrightarrow \text{SDP} \leftrightarrow \text{SEP} \leftrightarrow \text{SCP},$$

where:

SSPLSPR—the structure of spheres-processes of a multi-level system of public reproduction;
SPP—sphere-production process;
SDP—sphere-distribution Process;
SEP—sphere-exchange process;
SCP—sphere-consumption process.

$$\begin{aligned}\text{SLSMLSPR} = {} & (\text{ML} \leftrightarrow \text{LIRSMC} \leftrightarrow \text{WLE} \leftrightarrow \text{SML}) \\ & \leftrightarrow (\text{SML} \leftrightarrow \text{SMeL} \leftrightarrow \text{SMaL}),\end{aligned}$$

where:

SLSMLSPR—the structure of levels and sublevels of a multi-level system of public reproduction;
ML—micro level (level of individual enterprise, organization, firm);
LIRSMC—the level of intersectoral relations, including those structured into multisectoral corporations;
MC—a macro level (the level of the country's national economy as a single economic whole);
WLE—the world level of the economy, on the basis of IDCL (international division and cooperation of labor);
SML—a sub-micro level, as a single person, in its dual unity as an employee and consumer;

SMeL—sub-meso level, in the form of structural subdivision of the enterprise (organization)—department, service, workshop, etc.;
SMaL—sub-macro level—the level of the enterprise (organization, firm), which on the scale of levels is identical to the micro level (ML).

$$\textbf{SEIMLSPR} = [\text{PR} \leftrightarrow (\text{DDR} \leftrightarrow \text{RE} \leftrightarrow \text{REL} \leftrightarrow \text{RVLP})] \leftrightarrow \text{RCSTIP} \leftrightarrow \text{MMP} \leftrightarrow \text{MMS} \leftrightarrow \text{IS} \leftrightarrow \text{OMS} \leftrightarrow \text{LS} \leftrightarrow \text{TMS},$$

where:

SEIMLSPR—the structure of enlarged industries of a multi-level system of public reproduction;
PR—population reproduction;
DDR—directly demographic reproduction;
RE—reproduction of the ethical (spiritual and moral) level of population;
REL—reproduction of the educational level of population;
RVLP—reproduction of the vocational level of population;
RCSTIP—reproduction of cultural, scientific, technical, information products;
MMP—material and material production;
MMS—material and material services;
IS—information services;
OMS—organizational and management services;
LS—legal services;
TMS—trade and mediation services.

$$\textbf{SVSE} = \text{SB} \leftrightarrow \text{SE} \leftrightarrow \text{LB} \leftrightarrow \text{TE},$$

where:

SVSE is a structure of various sizes of entrepreneurship;
SB—small business;
SE—secondary entrepreneurship;
LB—large business;
TE—a transnational enterprise.

$$\textbf{SSEFE} = \text{IE} \leftrightarrow \text{CE} \leftrightarrow \text{PE} \leftrightarrow \text{SE},$$

where:

SSEFE—structure of socio-economic forms of entrepreneurship;
IE—individual entrepreneurship;
CE—collective (group, cooperative) entrepreneurship;
PE—public, including charitable, entrepreneurship;
SE—state entrepreneurship.

$$\textbf{SFCE} = \text{FE} \leftrightarrow \text{EI},$$

where:

SFCE—the structure of the degree of completeness of entrepreneurship;
FE—full entrepreneurship;
IE—incomplete entrepreneurship.

The authors developed the concept of a people-state directional and regulatory impact on entrepreneurship, understood in the broadest and deepest sense, with the difference between full and incomplete, monetary and in-kind, socially useful and harmful entrepreneurship, understood simultaneously and in parallel (in synergy) and as the primary importance of the link, and as the most important aspect (angle, cut, edge) of the system of multi-level social reproduction.

The main idea of this concept is the systematic influence of the State on behalf of the people on the sustainable development of entrepreneurship at all levels and at all levels of the system of multilevel social reproduction so that all processes and results of entrepreneurial activity, in the widest possible scope and most consistent with the dynamic proportionality of the national economy (taking into account strategic perspectives), optimized by the criterion of growth of national welfare (Yekhlakova 2020; Larionova et al. 2019b), in relation to the lifestyle corresponding to the ecology of man, nature, society (Yekhlakova 2020). Moreover, entrepreneurship involved in the institution and mechanism of public–private partnership (Dashkov and Repushevskaya 2019; Larionova 2018; Honchev 2018) is assigned, along with the state, a key role in the development of a strategy for the development of the national economy of Russia, based on the criterion of mutual benefit, on the one hand, of the people-state, and on the other, of the subjects of production and economic activity. At the same time, in the long-term strategic development, training of highly qualified personnel in the spirit and line of CREATIVE PROFESSIONAL CREATIVITY takes a key role, which implies appropriate development of the sphere of education (Salnikova 2019).

4 Discussion

In the context of fundamental changes in human civilization as a whole, in the economic sphere, among other things, the inevitability of fundamental changes in entrepreneurship is created, including the need for a people-state directional and regulatory influence on its development.

At the same time, we are talking about entrepreneurship in its broad meaning and deep sense (Dashkov and Nabieva 2019; Larionova 2018; Honchev 2018), and not about its extremely narrowed section in the form of small and medium-sized entrepreneurial structures. Therefore, it is necessary to focus on the understanding of entrepreneurship as one of the key categories of the economy, referring to it all innovative activities (being proactive, creative and creative in nature, but not always accepting a cash shell), acting in the form of their own business at their own peril. Moreover, entrepreneurship in some cases may be aimed not at market benefits,

but at a spiritual or material result in kind, sometimes contrary to monetary benefits. Entrepreneurship can be not only private, but also public, not only small and medium-sized, but also large and oversized, at the level of transnational corporations. It can be both complete, with the formation of a legal person and incomplete, but with its main property—INNOVATION (J. Schumpeter).

5 Conclusion

For the success of the above concept, the following are necessary:

(1) to ensure genuine national power in the country (denoted in the form of PLSN), in connection with which the state influence on entrepreneurship becomes the character of PEOPLE-STATE INFLUENCE (Larionov 2019);
(2) the formation and development in Russia of an integrated economic system (FISH), which organically combines consistency and a regulated market, in the implementation of strategic management and planning, programming, design based on the institution and mechanism of public–private partnership, with the synergy of positive properties of the impact on the economy of the state and private enterprise, while neutralizing their negative properties (Larionova et al. 2019a,2019b);
(3) a radical transformation of the monetary and financial-credit system in line with the national-state interests (KPDFKS), in case of abandonment of its model introduced into the country's economy in the 90s, in accordance with dogmas and attitudes of neoconservatism and monetarism (Larionova 2020);
(4) rational, in the national-state interests, corporate structuring of the national economy (NPCS), which allows to concentrate state strategic management and its development planning on enlarged production and economic facilities, which makes the economy of a huge state acceptable for centralized management and planning (Larionova et al. 2019b).

On the basis of all the above, we conclude the following formula:

$$\begin{aligned} \text{ANSDRIE} = \{&[\text{AIE} \rightarrow (\text{IGPC} \leftrightarrow \text{FIMS} \leftrightarrow \text{CTMFCS} \leftrightarrow \text{CSNE})] \\ &\rightarrow [\text{PGPRIE} \rightarrow \text{IASPLMLSR} \rightarrow \text{IAPRESPDNE} \\ &\rightarrow \text{OACGNWRLE} \rightarrow \text{BOIMPPP} \rightarrow \text{CSMPIPIPS} \\ &\rightarrow \text{RPCCF} \rightarrow (\text{IMMBPSEE} \leftrightarrow \text{UCSB})] \leftarrow \text{UCSB}\} \times \text{SII}, \end{aligned}$$

where:

ANSDRIE—an algorithm of the national and state directional and regulatory impact on entrepreneurship;
AIE—assumptions of impact on entrepreneurship;
IGPC—the implementation of genuine popular power in the country;

FIMS—formation of integrated management system;
CTMFCS—cardinal transformation of the monetary and financial and credit system;
CSNE—corporate structuring of the national economy;
PGPRIE—People-Government Policy and Regulatory Impact on Entrepreneurship;
IASPLMLSR—impact on all spheres-processes and levels of a multi-level system of social reproduction;
IAPRESPDNE—incorporation of all processes and results of entrepreneurship into the systematic proportional development of the national economy;
OACGNWRLE—optimization according to the criterion of growth of national welfare in relation to the lifestyle corresponding to the ecology of man, nature, society;
BOIMPPP—basing optimization on the institution and mechanism of public–private partnership;
CSMPIPIPS—concretization of strategic management and planning installations through programs, investment projects, state orders;
RPCCF—regulation of prices, commodity and cash flows;
IMMBPSEE—interaction of the mechanism of mutual benefit of the people, state, economic entities;
UCSB—uprooting corruption and speculative business;
TPSCCP—training of personnel in the spirit and line of creative and creative professionalism;
SII—the synergy of interpenetration-interaction.

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Formation of National Food Security

Alsu R. Nabiyeva and Alexander E. Suglobov

Abstract The scientific novelty, relevance, and socio-economic impact of procurement and sales by consumer cooperatives lie in ensuring regional food security and increasing the efficiency of cooperative and household farms. Food security is the most important part of socio-economic policies in any country. It serves as an essential factor for increasing the quality of life and the standard of living. The Government of the Russian Federation developed several measures for implementing the Food Security Doctrine of the Russian Federation. Federal and regional authorities systematically evaluate and improve the food security of Russia, develop and implement new legal provisions. In this study, we described the operational and social mission of farming enterprises and households of Russia and its regions. Moreover, we outlined the development potential of cooperatives and their interaction with farming enterprises and households. We examined the mechanism of collaboration between several small-sized forms of enterprises and cooperatives in the formation of food resources in the modern economy. Additionally, we analyzed the efficiency of small agricultural enterprises in using rural resources and population for providing high-quality food products to the nation.

Keywords Food security · Cooperatives · Regional economy · Consumer cooperation · Household farms · Farmers · Agriculture · Socio-economic impact · Rural territories · Procurement-sales cooperatives · Sales · Competition · Agricultural goods · Sales activity

JEL Codes F52 · H56

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1 Introduction

Consumer cooperation is directly involved in forming national food security since it provides services to agricultural producers. The impact of consumer cooperatives on food security increases considerably if their collaboration with small agricultural producers (including households and farming cooperatives) rises.

Russian Federation has a large number of household farms and farming cooperatives. However, their sales potential is severely limited, despite the efforts of the government. Large chain stores, which dominate the Russian market, need large-scale, regular shipments of agricultural products. Therefore, farming cooperatives and household farms form the foundation for procurement activities of consumer cooperation.

In Russia, tens of millions of people produce all kinds of agricultural goods on private plots (that they received as shares of terminated agricultural enterprises).

This study aims to achieve the following:

- Outline the role of cooperatives in ensuring national and regional food security;
- Analyze the development potential of cooperatives and their interaction with farming enterprises and households;
- Substantiate the mechanism of collaboration between several small-sized forms of enterprises and cooperatives in the formation of food resources in the modern economy;
- Examine the efficiency of small agricultural enterprises in using rural resources and population for providing high-quality food products to the nation.

2 Materials and Methods

The scientific basis of this study is formed by the conventional methods of research and the works of Russian scholars on the role of cooperation in ensuring regional food security (Balalova et al. 2021; Bank et al. 2018; Bessonov and Suglobov 2019; Bessonova et al. 2018, 2021; Dudukalova et al. 2020; Kontsevaya et al. 2020, 2015; Maksaev et al. 2021; Maloletko et al. 2021; Nabiyeva 2021; Ryabova et al. 2020; Sekerin et al. 2019; Shamin et al. 2020). Additionally, we considered the sustainable development of cooperatives, household farms, and farming cooperatives; their share in the overall production of agricultural goods and in national food security.

The study employs general methods of research; the methods of synthesis and analysis; logical and monographic approaches; as well as patent and comparative methods. We used conventional economic methods to evaluate the current situation in the sector of small agricultural enterprises. To forecast the prospects of innovative development in small-sized forms of agricultural enterprises and the use of consumer cooperation, we employed the analytical method.

3 Results

National food security is a vital direction of the national security of Russia, both currently and in the future, since it serves as the main condition for preserving the state and its sovereignty. Food security is a predominant part of socio-economic policies and an essential component of ensuring a better quality of life and a higher standard of living. Providing food security is a top priority for the leaders of any state. Both federal and regional authorities of Russia focus their attention on providing national food security.

According to the Presidential Decree "On Approval of the Food Security Doctrine of the Russian Federation" (Presidential Executive Office 2021), the Government of the Russian Federation is to develop a system of measures for ensuring a sustainable supply of foodstuffs that correspond to the norms of dietary diversity and medical nutritional standards. Therefore, the Government systematically evaluates and plans measures for ensuring Russian food security; develops new relevant legal provisions. Moreover, one can observe positive changes in providing for the turnover of money and agricultural goods between producers and consumers in the regions.

Consumer cooperation has an important role in ensuring national food security since it provides services for agricultural producers. Regional consumer cooperatives are experienced in procurement and processing of agricultural goods and foodstuffs, as well as their sales via wholesale and retail consumer cooperative stores.

Food distribution activities of regional consumer cooperatives serve as a strategic direction of national food security. This direction expresses the views of cooperative members on the impact, role, and task of cooperation in achieving the objectives of federal policies on food security of Russia.

In 2019, the procurement of agricultural products and raw materials accounted for 11.9% of all activities of regional consumer cooperatives and the Central Union of Consumer Cooperatives (Centrosoyuz) in Russia. At the same time, the turnover of the foodservice industry accounted for 6.9%. Among the Russian regions, the Volga Federal District accounted for the most procurement—17.6%.

At the cooperatives of Centrosoyuz in 2015–2019, the weight of agricultural production procurement increased from 9.9 to 11.8%. We note that the weight of foodstuffs in the consumer cooperation turnover of Russian regions increased from 75.7 to 77.7% (up by 2%). This index denotes the deterioration of the purchasing power—currently, food purchases account for more than three-quarters of the population's expenses. Correspondingly, the weight of non-food purchases decreased from 24.3 to 22.3% (down by 2%). The share of non-food sales by consumer cooperatives decreased in this period.

In 2015–2019, regional consumer cooperatives decreased the procurement of vegetables from 57.8 to 40.8 thousand tons (down by 29.4%). Moreover, the average annual decrease ranged from 20 to 30%. During the five-year period, the most significant decrease was observed in the Ural Federal District—from 3.5 to 1.6 thousand tons (down by 54.3%) (Fig. 1).

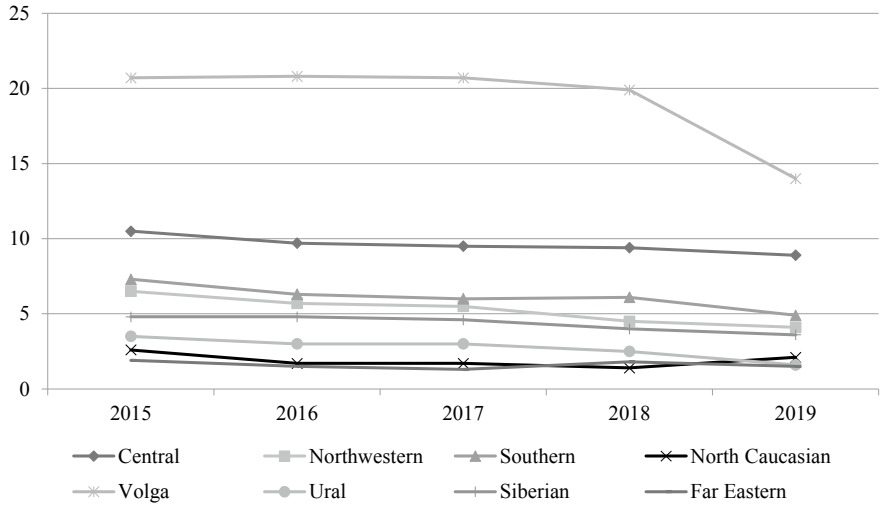

Fig. 1 Trend lines of vegetable procurement by the consumer cooperatives of Centrosoyuz, arranged by the Federal Districts of the Russian Federation; in thousand tons. *Source* Compiled by the authors based on Central Union of Consumer Cooperatives of the Russian Federation (2020)

Traditionally, consumer cooperatives procure large amounts of potatoes and sell them in agricultural and cooperative markets in urban and industrial centers. However, in 2015–2019, potato procurement by consumer cooperatives fell from 52.6 to 33.5 thousand tons (down by 26.3%).

In 2019, the highest procurement of potatoes by consumer cooperatives was observed in the Volga Federal District—11.9 thousand tons, which accounts for 35.5% of total potato procurement by consumer cooperatives in Russia. Starting with 2016, potato procurement fell annually by 10–28%. The biggest decrease in potato procurement could be observed in Northwestern and Volga Federal Districts (Fig. 2).

The procurement of meat and meat products by consumer cooperatives fell from 64.7 to 52.5 thousand tons (down by 18.9%) in 2015–2019. The decreases were only observed in some years; in 2019, the procurements fell by 8.3 thousand tons (down by 13.7%).

The consumer cooperatives of Volga Federal District procured the most meat—24.9 thousand tons in 2019 (47.4% of all meat procurements by Russian consumer cooperatives). The biggest decrease in meat procurement was observed in the Southern Federal District—from 3.4 to 1.6 thousand tons (down by 52.9%). During 2015–2019, the consumer cooperatives of Northwestern Federal District increased meat procurement from 6.7 to 6.9 thousand tons (up by 3.0%). In the Far Eastern District, meat procurement increased from 0.9 to 2.2 thousand tons (up by a factor of 2.4) (Fig. 3).

The vast majority of the rural population keeps dairy cows that produce fresh milk daily. Selling perishable produce requires having a reliable distribution channel—for

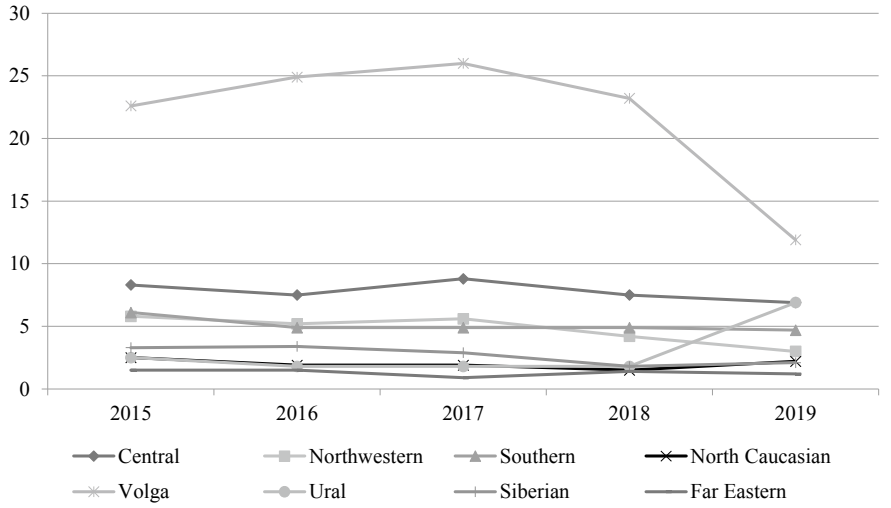

Fig. 2 Trend lines of potato procurement by the consumer cooperatives of Centrosoyuz, arranged by the Federal Districts of the Russian Federation; in thousand tons. *Source* Compiled by the authors based on Central Union of Consumer Cooperatives of the Russian Federation (2020)

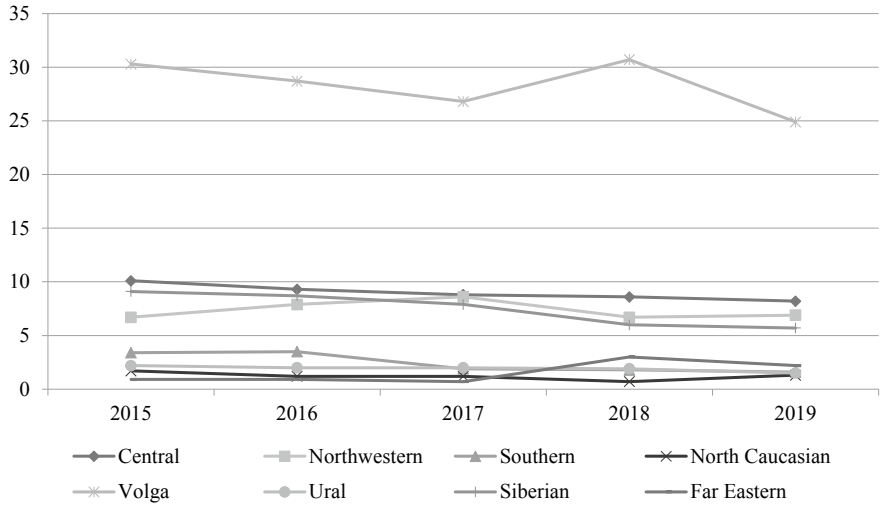

Fig. 3 Trend lines of meat and meat products procurement by the consumer cooperatives of Centrosoyuz, arranged by the Federal Districts of the Russian Federation; in thousand tons. *Source* Compiled by the authors based on Central Union of Consumer Cooperatives of the Russian Federation (2020)

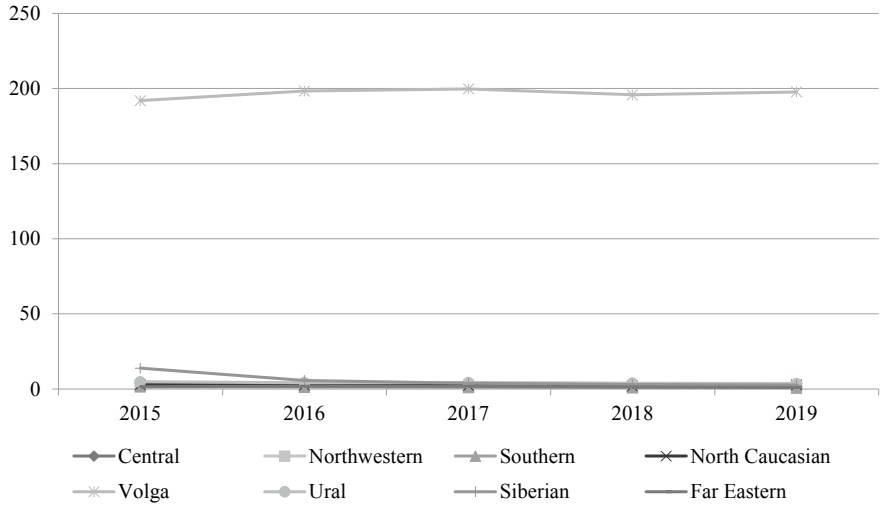

Fig. 4 Trend lines of dairy procurement by the consumer cooperatives of Centrosoyuz, arranged by the Federal Districts of the Russian Federation; in thousand tons. *Source* Compiled by the authors based on Central Union of Consumer Cooperatives of the Russian Federation (2020)

example, the procurement enterprises of consumer cooperatives. However, overall procurement of dairy by consumer cooperatives decreased from 221.9 to 218.9 thousand tons (down by 1.4%). In Volga Federal District, dairy procurement increased from 191.9 to 197.7 thousand tons in 2015–2019 (up by 3.0%). Volga Federal District accounted for 90.3% of overall dairy procurements by consumer cooperatives in 2019 (Fig. 4).

In Russia, around three-quarters of fruits and berries in Russia are produced by household farms and farming cooperatives. However, the procurement of these product types by consumer cooperatives decreased from 39.1 to 24.5 thousand tons (down by 37.3%) in 2015–2019. The annual decrease of procurement fluctuated from 10 to 19%. The biggest decrease was observed in North Caucasian District (from 6.7 to 0.5 thousand tons; down by 92.5%) and in Far Eastern District (from 0.4 to 0.2 thousand tons; down by 50.0%). The consumer cooperatives of Volga District procured the most fruits and berries from the population (Fig. 5).

In 2015–2019, regional consumer cooperatives of Russia decreased the procurement of all agricultural goods types. Overall, dairy procurements decreased annually; a small spike in procurements in 2017 did not correct the situation. Potato procurements fell drastically. Procurements of vegetables, fruits, and berries also decreased annually and significantly. The procurement of meat products by the consumer cooperatives of Central, North Caucasian, Southern, and Ural Federal Districts decreased significantly, especially in the Southern District.

Dairy procurement saw major decreases in 2015–2019 in all Federal Districts, especially in the Siberian Federal District—from 13.8 to 2.6 thousand tons.

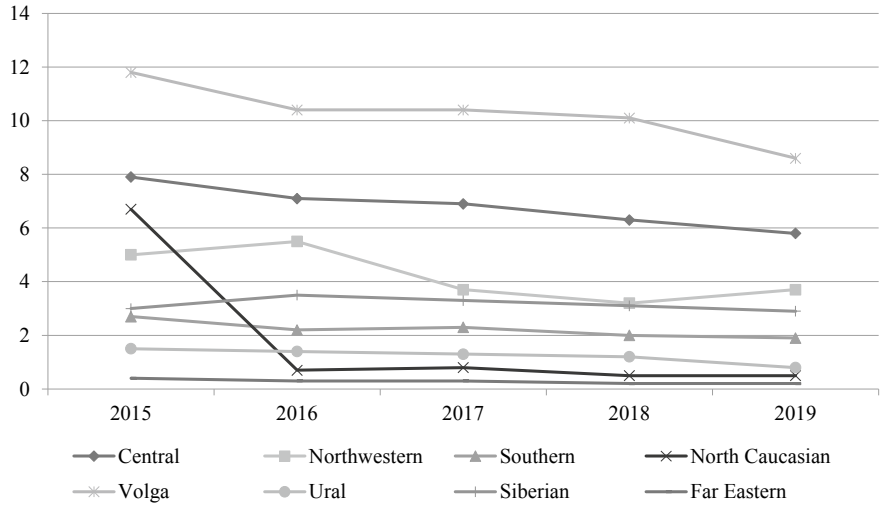

Fig. 5 Trend lines of fruit and berries procurement by the consumer cooperatives of Centrosoyuz, arranged by the Federal Districts of the Russian Federation; in thousand tons. *Source* Compiled by the authors based on Central Union of Consumer Cooperatives of the Russian Federation (2020)

4 Conclusion

In this study, we analyzed the impact of consumer cooperatives on regional and national food security and their influence on the activities of the population and farmers. We outlined and examined the role of consumer cooperatives in the formation of food surplus. Additionally, we recommended several approaches to strengthening the collaboration of household farms and cooperative farms with consumer cooperatives of the Centrosoyuz in procurement, sales, increasing food surplus, and expanding the role of cooperation activities in national food security.

Due to current embargoes and economic sanctions, the Russian agro-industrial complex must be sufficiently developed to ensure national food security, to guarantee the physical and economic access of all population groups to foodstuffs that correspond to the norms of dietary diversity and medical nutritional standards.

The natural and economic environment of Russia allows producing staple foodstuffs of animal and plant origin. Procurement organizations of the Centrosoyuz consumer cooperatives can positively impact the system of food distribution. Consumer cooperatives are adequately equipped for this task—they have significant material-technical and labor resources, as well as high-quality staff and well-tried organizational-economic mechanisms.

The main acting subject of consumer cooperation is a member. Members serve as a social basis, an economic foundation, and a competitive advantage of consumer cooperatives. Regional unions of consumer cooperatives in Russia are experienced in procuring and processing agricultural products and foodstuffs, as well as selling

them to consumers and the population via cooperative stores. Consumer cooperation in food distribution is a strategic direction of work that expresses the opinions of cooperation members on ensuring national food security.

Cooperation allows uniting disjointed small enterprises, pooling their labor, land, financial, transport, sales, and other resources for their more efficient use. Consumer cooperation raises the efficiency of household farms, cooperative farms, and other small-sized forms of rural farming enterprises.

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Features of Strategic Management of Cable Industry Sustainable Development

Ludmila V. Marabaeva, Elena G. Kuznetsova, Roman R. Hairov, and Tatyana E. Shilkina

Abstract The concept of sustainable development implies the realization of socio-economic and political relations at all levels of the management hierarchy, including at the level of enterprises, since they directly affect not only the economy, but also the ecology and life of people—employees, their families, etc. To a large extent, the success of achieving the sustainable development goals of the enterprise due to its concept depends on the effectiveness of strategic management of the business, taking into account its sectoral and other characteristics. The results of the research presented in the article are based on the synthesis and analysis of Russian and foreign research on the problems of developing and implementing strategic management of companies based on the concept of sustainable development. As a research base, cable industry enterprises were chosen, whose products are in demand by consumers representing a variety of sectors of the national economy. Using monographic, graphical and analytical, statistical, index and other methods, results were obtained to conclude that the goal of this research was achieved. Sectoral features affecting the content and quality of strategic management of sustainable development of cable industry enterprises were identified, and conclusions were drawn on the need for further research in this area, including in terms of the development of new methods for strategic management of their sustainable development. Based on the results of the research, the concept of sustainable development of the enterprise was studied in depth, as well as the main features of strategic management of cable industry enterprises.

Keywords Enterprise · Strategy · Sustainable development · Economic aspect · Environmental aspect · Social aspect · Cable industry

JEL Codes D240 · E230 · G340 · L610 · M390 · O470

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1 Introduction

Aware of the importance of the negative and positive aspects of globalization, the world community has come to understand that, through these processes, the strong can help the weak on a global scale, while future generations can multiply achievements, and not to solve the problems created by their predecessors. One consequence of this understanding has been the development of the concept of sustainable development. The topic of the research is very relevant, as the global economic system increases the demand for the green economy model, which preserves and multiplies ecosystems and biodiversity, and does not reduce them. Employees and their well-being and development become the main value of enterprises, and in order to achieve business goals, it is necessary to have an economic, social, environmental and institutional component that is resistant to the negative effects of factors of the internal and external environment. Implementation of the long-term objectives of the enterprise development implies the presence of a strategic management system capable of ensuring effective management of the sustainable development of the enterprise.

2 Materials and Methods

The results of research by many specialists suggest that in modern Russian practice, most enterprises do not have accepted goals for sustainable development and system strategic management. One of the reasons for this situation is the lack of development of strategic enterprise management systems, Low awareness among partners and other stakeholders of the concept of sustainable development, which means that there is no demand for sustainable development reporting in Russia, lack of knowledge of the effects of achieving sustainable development goals, etc. where there is no formed corporate strategic management system, the mission, strategic concept and goals are not formalized, but are in a state of "ideas" at the top management of the enterprise.

In Russian science, the problems of sustainable development are studied mainly at the levels of the national economy, regions or industries (Bobylev 2015; Vertakova 2017; Vostrikova 2014, etc.). A significant number of works are devoted to the study of corporate social responsibility issues, partly in the context of sustainable enterprise development (Belyaeva 2016; Blagov 2010 etc.).

Foreign studies on this issue are much wider. The work of experts such as Elkington (2018), Amui et al. (2007), Marshall and Brown (2003) However, there is a well-known problem of taking into account the peculiarities of doing business at Russian enterprises, including industry ones, in the process of adapting foreign developments. Thus, the need to address the methodological and practical problems of strategic management of its sustainable development is increasing, taking into account sectoral and other characteristics of activities.

In the course of the research, the works of scientists and specialists were used on the problems of strategic management of the sustainable development of an industrial

enterprise, materials from scientific periodicals, scientific and practical conferences, Internet resources, statistical and analytical materials reflecting the results of cable industry enterprises, etc. The methodological basis of the research was: monographic method, graphic and analytical methods, statistical method, index method, etc.

3 Results

The strategic management of sustainable development in cable industry enterprises does not differ significantly from industrial enterprises in other industries, based on the same principles and concepts. However, the key features are the technologies used, the products produced, as well as the financial situation of cable industry enterprises.

More than 90 manufacturers are represented on the Russian market of cable conductors. According to experts, a characteristic feature of the Russian cable industry is high consolidation. Figure 1 shows the structure of cable production. 45% of the total output is from cable equipment for power engineering, 17% is the share of checkpoints for installation on electrical equipment and devices, 15% is cables and wires for transport infrastructure, 13% is the segment that is busy with cable and conductor products for communication.

Based on these statistics, we can argue that most of the products are intended for electricity transmission, which accounts to more than 50% of all products. In this regard, one of the main features in the strategic management of sustainable development in cable industry enterprises is the purpose of products. One of the goals in the concept of sustainable development is the transition to rational consumption and production, except for the energy sources themselves, which generate clean energy, and the means of its transmission and delivery are also necessary. The cable acts as such a mediator. The materials and technologies used in the production of cables and wires depend on the number of losses during the transmission of electricity.

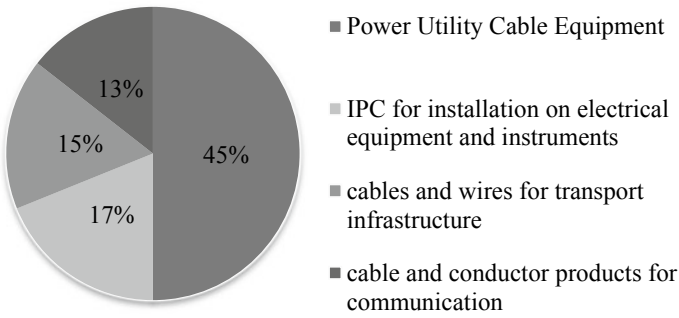

Fig. 1 Structure of cable products production by the CIS cable industry enterprises in 2017–2019. *Source* Federal State Statistics Service (2020)

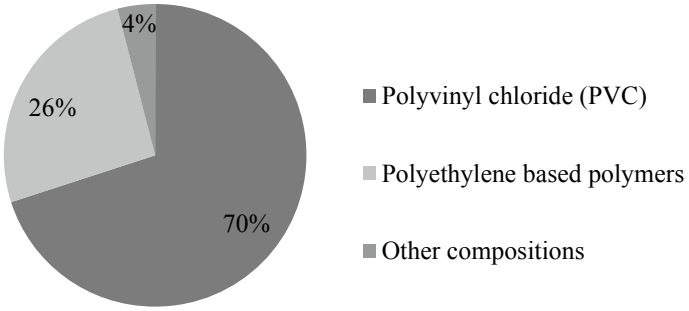

Fig. 2 Structure of production of insulating materials by the CIS cable industry enterprises in 2017–2019. *Source* Federal State Statistics Service (2020)

Thus, strategic R&D for new materials and technologies (e.g. superconductors that have zero resistance at—196 degrees Celsius), which reduce energy transmission losses and achieve sustainable development goals in the delivery of cheap energy and the transition to rational consumption and production, play an important role in the strategic management of sustainable development of cable industries.

If we talk about insulation materials, then in the domestic market for cable equipment about 70% falls on polyvinyl chloride (PVC). Figure 2 shows the polyethylene-based polymer sector in total production is 26%, the remaining 4% is accounted for by other compositions.

Polyvinyl chloride, as well as compounds based on it, are one of the main sources of environmental pollution, since most spent plastics remain in landfills, and are not recycled.

In this regard, as well as the fact that most of the insulating materials in cable products are made of polyvinyl chloride, and Russian companies use the method of annealing the winding on the fire when recycling waste, is the following feature of the strategic management of the sustainable development of cable industry enterprises—a high degree of pollution in waste and scrap production. Also, the financial condition of the industry, and the dynamics of production, is an important factor that determines the features of strategic management of the sustainable development of cable industry enterprises.

Statistics indicate that in 2018 in the Russian Federation there was an increase in industrial production by 2.9%; in 2019 these rates slowed slightly, and growth amounted to 2.4%. In 2019, spending on national projects, including construction, also increased. At the same time, there was a reduced growth in investments in fixed assets. So in 2019 it amounted to 1.7%, in 2018 this figure was 5.4% compared to the previous year.

Obviously, the state of affairs in the leading sectors of the national economy directly affects the main shows of the cable industry.

There are several associations and holdings in the industry, including enterprises of the CIS countries. One of the largest structures is the Electrocabel Association,

Table 1 Dynamics of main shows of production bodies by cable industry enterprises of CIS countries in 2015–2019

CIS states	Production of cable products, % of previous year				
	2015	2016	2017	2018	2019
Russia	100	107	113	120	99
Belarus	100	129	109	107	95
Ukraine	100	114	118	105	92
Kazakhstan	100	119	93	95	97
Total in CIS	100	110	112	115	98

Source International Electric Cable Association (2020)

which consists of 83 enterprises. The performance of the Association's member enterprises representing the CIS countries is shown in Table 1.

As it can be seen from Table 1 in 2019, there was a slight decline in production. In the industry it amounted to 2%. To a greater extent, such a small decline is explained by a decrease in the production of cable products with a copper content, but the production of fiber-optic cables increased by the end of 2019 and amounted to 28% compared to the previous year. At the same time, production growth in 2018 can be explained by an increase of 19.6% in housing construction, as well as preparations for the World Cup.

The status of export and import operations, as presented in Table 2, is important in assessing the situation in the industry.

As it can be seen from the above data, import operations were relatively stable, but there was a decline in growth in 2018 and a decrease in imports by 2% in 2019. According to experts, the decrease in import operations can be explained by the import substitution policy, which was implemented to support domestic enterprises, including the cable industry (Meshchanov and Peshkov 2020).

The analysis presented suggests that the cable market is relatively stable, but there are fluctuations in demand based on changes in the structure of large projects, including construction. As a result, the market is predictable, which contributes to maintaining the stable financial condition of enterprises with a significant share of it.

Table 2 Dynamics of FEA volumes of CIS cable industry enterprises in 2016–2019

Indicator	Volume of FEA, in % to the previous year			
	2016	2017	2018	2019
Import volume	100	124	109	98
Export volume	100	120	125	105

Source International Electric Cable Association (2020)

Also important is the social aspect of the sustainable development of industry enterprises, which provides for the performance of work related to social responsibility and partnership with employees. In general, the directions of work on the social aspect in cable industry enterprises do not differ from those in other industries, but there are some features. On average, the average number of employees in cable industry in Russia is 250–350 people. According to the criteria of small and medium-sized enterprises, such enterprises go beyond the medium and are large. Most of the employees, 60% on average, are workers in production workshops. Based on the territorial location of most cable industry enterprises that are members of the "Electrical Cable" association in particular, we can say that they are one of the systemically important enterprises in their regions.

4 Discussion

The results of the research suggest that in order to achieve the goals of sustainable development, industry enterprises need to develop sustainable development strategies taking into account the importance of proper waste management, as well as the possibility of switching to materials that are processed more easily than PVC, without losing the operational properties of the products.

In terms of factors affecting the production and financial well-being of enterprises, as well as the peculiarities of managing their sustainable development, it can be noted that positive results of import substitution policies are observed, but, at the same time, problems are manifested related to foreign economic sanctions against the Russian economy, other global challenges, etc. Much of the current challenges are due to the increasing impact of the COVID-19 pandemic.

It is also possible to highlight the features of the strategic management of sustainable development of cable industry enterprises in the social aspect:

- the need to provide personnel with protective equipment due to the peculiarities of the production process, regular medical examination of employees, etc.;
- rendering the financial and non-material support to employees and their families in cases of urgent need;
- investing in the education and skills of employees, regular professional development, participation in educational programs, targeted training of potential employees of the enterprise;
- implementation of the social programs directed to improvement of quality of life and work of staff of the enterprises and their families;
- upholding an honest and open wage policy;
- implementation of programs of support and increase in cultural and ethical level of staff of the enterprise and their families;
- et al.

5 Conclusion

The research showed that the concept of sustainable enterprise development is actively explored in the world. A rather large emphasis on achieving sustainable development goals is placed in foreign companies. Preference is given to partners working on the basis of this concept and provide annual reports on results achieved by respective groups of indicators. However, in the practice of Russian enterprises, it is rarely possible to observe the officially adopted concept of sustainable development, and the strategic goals formed on its basis.

The main features of the strategic management of sustainable development of cable industry enterprises are as follows:

Most of the cable products are designed for power transmission, and there are losses in this process that need to be addressed in the future; the main insulating material is PVC, which leads to high toxicity of waste when using non-ecological recycling methods; stability of the cable products market of the last 3 years makes it possible to predict trends in its development, as a result of which it is possible to achieve financial stability of enterprises, but the market is dependent on large projects.

As the research showed, the management of sustainable development in our country is relatively developed in large enterprises that actively interact with foreign partners. It can be assumed that this is due to the smaller scale of scientific and practical research in comparison with foreign ones, aimed at identifying clear positive effects from the introduction of the provisions of the concept of sustainable development into the practice of strategic management of Russian enterprises. Therefore, in our opinion, it is very important to study in depth the possibilities of applying new methods of strategic management of sustainable development, which can be used not only in cable industry enterprises, but also in enterprises of other industries, taking into account their size, financial and organizational capabilities, industry characteristics of production, etc.

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Opportunities of Cooperatives for Sustainable Development of the Fruit and Vegetable Market of Russia

Svetlana M. Ryzhkova and Valentina M. Kruchinina

Abstract Vegetables, fruits and berries are products that ensure food security in Russia. Despite the fact that the average per capita consumption of vegetables and fruits in Russia is constantly growing, it has not yet reached rational consumption standards. The main share of vegetables and fruits is grown in households, so there is a problem of supply of grown fruits and vegetables in this sector of producers. The sustainable development of the fruit and vegetable market involves an increase in the average per capita consumption of vegetables and fruits by the population, an increase in its own production of this type of food, and ensuring its stable entry into the market. The purpose of the work is to study the possibilities of cooperatives for the sustainable development of the fruit and vegetable market in Russia. The following scientific methods: analysis and synthesis, observation, abstraction and comparison, and monographic made it possible to conduct this research and define the concept of sustainable development of the fruit and vegetable market. The authors concluded that all types of cooperatives have their own interests in the fruit and vegetable market. Combining the means and capabilities of cooperatives to build various workshops in the place of production of fruits and vegetables will not only reduce losses and increase the added value of products, but it will also create jobs for rural residents. The integrator can be a consumer society, guaranteeing the sustainable sale of fruits and vegetables. The involvement of peasant farms and households in the market turnover will make it possible to reduce the dependence of the Russian market for fruits and vegetables on imports, which as a result will make the market for fruits and vegetables more stable.

Keywords Sustainable development · Fruit and vegetable market · Average per capita consumption · Cooperatives · Consumer cooperation

JEL Codes O15

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1 Introduction

Fruit and vegetable products have firmly entered the human diet. It provides the body with fiber, vitamins, minerals and carbohydrates. It has few fats and calories. Vegetables and fruits are recommended for daily consumption by all categories of the population, especially the sick, children and the elderly. These products are in demand with fond healthy meals and fashionable diets (vegetarianism, fitness, raw foodism, etc.). This applies to both fresh fruits and vegetables, as well as processed ones. Therefore, the UN declared the next year 2021—the International Year of Fruits and Vegetables as part of the implementation of the Sustainable Development Agenda for the period up to 2030 (Agenda by 2030). In the world this idea is welcomed by large segments of the population, governments of many countries, business communities, cooperatives. Russia also supports this UN initiative. Therefore, in January 2020, a new Doctrine of Food Security of the Russian Federation was adopted: vegetables and gourds, fruits and berries were added to the food range evaluating food independence. And in 18.11.2020, the Government of the Russian Federation approved a "roadmap" for the accelerated development of fruit and berry production until 2023. By April 2021, according to this roadmap, mechanisms for the sale of fruit and berry products should be determined, including through combining into agricultural cooperatives, ensuring access to wholesale and retail chains and stimulating the export of these products and their processing products.

2 Methodology

The purpose of the work is to study the possibilities of cooperatives for the sustainable development of the fruit and vegetable market in Russia. Therefore, the following tasks were solved: an analysis of the domestic fruit and vegetable market was carried out according to the indicators of "volumes" and "structure of production," possible vectors of its development were outlined, a comparison of average per capita consumption of vegetables and fruits with rational consumption standards was made, the possibilities of consumer cooperation as a participant in the marketing chain to bring fruits and vegetables to consumers were studied. The following scientific methods were used: analysis and synthesis, observation, abstraction and comparison, monographic. The following materials and sources were used: articles and works of scientists published in periodicals and obtained through the Internet, reports and collections issued by the Federal State Statistics Service (FSSS) and annual reports of the Central Union of Consumer Societies of the Russian Federation.

3 Results

Due to their valuable qualities, vegetables, fruits and berries belong to products that ensure food security in Russia. The Food Security Doctrine of the Russian Federation defines food independence standards for vegetables and melons in the amount of at least 90%, and for fruits and berries—at least 60%. In 2019, these figures were 90.2% and 40.5%, respectively.

For vegetables and melons, the standard corresponds to a threshold value, which is explained by an increase in domestic production and a decrease in imports of these products. So, in 2019, the production of vegetables and melons increased by 38.8% compared to 1990, and imports decreased by 16.3% over the same period. The volume of own production of these agricultural products was 6.5 times higher in 2019 than the volume of imports (Table 1).

The situation is different for fruits and berries. Until the 2000s, domestic production was ahead of imports, with the exception of 1991, when imports amounted to 4.7 million tons, and the country produced 2.7 million tons of fresh fruits and berries. Since 2001, there was a turning point in trends in the fruit and vegetable market—imports began to exceed domestic production annually (Ryzhkova 2015a, p. 386). In such a way, if production for the period 2000–2019 increased by 40.0%, then import has increased by 2.5 times. In 2019, production lagged behind imports by 34.4% (Table 1).

Due to the ban on importing fruit and vegetable products from the USA, EU countries, Ukraine, Canada, Norway, Australia into Russia in 2014, imports of both vegetables and fruits began to decline—by 17.5% and 3.8%, respectively (2019–2014). This makes it possible for domestic producers to take the place of foreign suppliers. However, the main production of fresh vegetables, fruits and berries is concentrated in semi-subsistence farms—peasant (farm) farms and households (Table 2). Therefore, for example, only 40.9% of vegetables produced in all categories of farms in 2019 entered the market. As for agricultural organizations, the sales here are higher, and in the same year they amounted to 76.5% of the volume of vegetables grown.

Table 1 Production and import volumes of fruits and vegetables in Russia, million tons

Resources	Years								2019 to 2018, %
	1990	2000	2005	2010	2015	2017	2018	2019	
Vegetables and gourds									
Production	11.4	11.4	12.1	12.2	15.0	15.4	15.7	15.9	101.3
Import	2.9	2.3	3.5	3.1	2.6	2.7	2.5	2.4	96.0
Fruit and berries									
Production	3.0	3.0	2.7	2.4	3.2	3.3	4.0	4.2	105.0
Import	2.5	2.6	4.6	6.8	6.5	6.7	6.7	6.4	95.6

Source Compiled by authors according to FSSS

Table 2 Structure of vegetable and fruit production in Russia in 2019, %

Farm categories	Vegetables	Berries
Farms of all categories	100	100
All agricultural organizations	28.1	27.5
Peasant Farms	20.2	6.2
Household sectors of the population	51.7	66.3

Source Compiled by the authors according to FSSS

Despite the fact that the average per capita consumption of vegetables and fruits in Russia is constantly growing, it has not yet reached rational consumption standards. At a rate of 140 kg, the consumption of vegetables and melons per capita in 2019 was 108 kg (77.1%), and fruits and berries at a rate of 100–62 kg (62.0%) (Fig. 1). And while for vegetables and melons, consumption in households in rural areas is slightly higher than in urban areas (105.8 kg and 103.5 kg, respectively), there is a lag in fruits. In terms of households, 68.0 kg of fruit and berries are consumed in rural areas, which is 10.2% less than in urban areas (75.7 kg) on average per consumer.

In order to achieve an increase in the average per capita consumption of vegetables and fruits, it is necessary not only to increase the domestic production of this type of food, but also to ensure its stable entry into the market. At the same time, it should be noted that the fruit and vegetable market of Russia is characterized by dependence on imports, a significant share of fresh fruits and vegetables production in semi-subsistence farms, obsolete fruit and vegetable storage facilities, significant distances between production and consumption areas, which requires specialized transport, seasonality of production, high degree of processing due to the perishable nature of this type of agricultural products, etc. (Ryzhkova 2015b, p. 77).

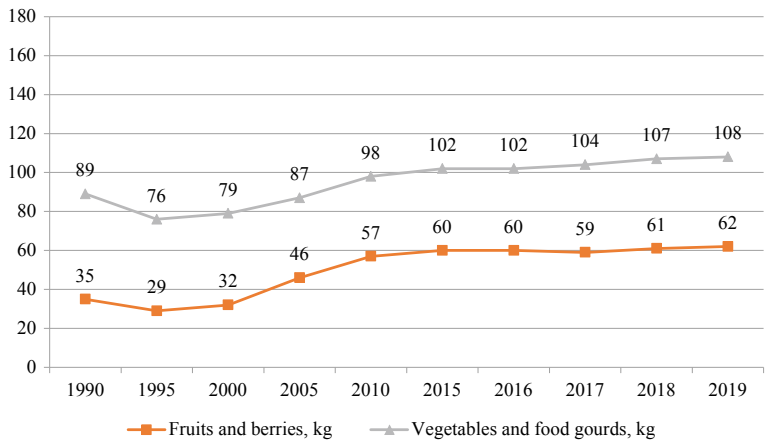

Fig. 1 Consumption of vegetables and fruits in Russia, kg, average per capita. *Source* Compiled by the authors according to the FSSS

Since the majority of vegetables and fruits are grown in households, this is aimed at solving the problem of the supply of grown fruits and vegetables to the market in this sector of producers. In our opinion, this can be done through the development of cooperatives of all types.

Currently, various types of cooperatives are formed in rural areas: consumer, agricultural consumer and production, credit, agro-service, marketing, etc. (Kruchinina 2015, p. 99). Professor M. N. Sobolev outlined the prominent role of cooperation in the market at the beginning of the twentieth century. pointing out that the peculiarity of cooperation in the exchange process is that it creates a united market subordinate to the conscious will of cooperative groups (Sobolev 1919, p. 104). In the meantime, it is too early to talk about such a market in Russia, since each type of cooperative, as a rule, acts independently to achieve its interests.

Due to small batches of fruits and vegetables, heterogeneity of the goods, problems with the rhythm of deliveries, lack of money to pay the input bonus to the store (retail chain) peasant farms and households, it is difficult to compete in the market with large producers. The first cooperative scientists wrote about the differences in opportunities between various agricultural producers. Therefore, A. V. Chayanov noted that a large farm, receiving a large volume of products from its fields, can sell it by cars to processors and wholesalers and at the same time receive a high wholesale price. Small farms are forced to sell their products in small batches at farmer's markets or resellers at very low prices. Therefore, it does not reach the wholesale market (Chayanov 1918, p. 8).

A. V. Chayanov also emphasized that several small farms is enough to unite in a cooperative, as all the advantages of a large economy will be at their disposal: a credit partnership will give working capital; consumer society and purchasing partnership will deliver the necessary products and tools of production; Sales cooperation will sell the goods produced profitably; machine partnership will provide equipment; processors will establish processing of agricultural products (Chayanov 1918, p. 15).

The conclusion of A. V. Chayanov on the mutually beneficial cooperation of small farms and various types of cooperatives remains relevant today. If we follow the logic of the scientist, we can conclude that not only the unification of small producers of fruits and vegetables into cooperatives, but the interaction of cooperatives among themselves can increase the commodity mass in the fruit and vegetable market, as well as create a stable environment for the development of rural areas.

In Soviet times, one type of cooperation functioned in rural areas—consumers'. Its interests included wholesale and retail trade, including international, catering, procurement, industry, transport and construction. Organizations of consumer cooperation were monopolists in the field of trade in the countryside. They also had no competitors in procurement activities. Markets and market places were poorly developed, and most of the surplus population was handed over to procurement offices. Purchased raw materials and food were sold through their own stores, processed in workshops (bakery, sausage, smoke house, pickling, etc.), supplied by public procurement and to cities (Kruchinina and Ryzhkova 2020).

Consumer unions and societies were an important infrastructure element that ensures the livelihood of villages. They were one of the main employers in rural

areas. And although consumer cooperation gradually began to lose its importance due to the collapse of the USSR, it retained the capacities that can be used to integrate various types of cooperatives and small farms located in a certain territory (Sharkova et al. 2020, p. 135).

Vegetables, fruits and berries are one of the traditional products of procurement activities of consumer cooperation. However, compared to gross collections, the harvesting volumes are minuscule and tend to decline continuously (Ryzhkova 2016, c. 226). In various years, from 0.4 to 0.7% of all vegetables grown in these farms and from 1.0 to 2.1% of fruits are purchased from the main producers of fresh fruits and vegetables—households and peasant farms (Table 3).

Such a low percentage of the coverage of vegetable and fruit producers by consumer cooperation organizations has various reasons: small quantities of goods, the distance of producers' residence from procurement offices, the lack of transport for small producers to deliver products to the place of procurement, the substandard products, low prices of procurement, the lack of information, not all consumer societies are engaged in procurement or have sufficient capacities for this, the quality of local roads, etc. (Ryzhkova 2019, p. 89).

The merging of peasant farms and domestic production into an agricultural production cooperative (APC) allows these groups of fruit and vegetable producers to consolidate their interests in entering the market and provide high value-added sales. In addition, it is easier for procurement offices of consumer cooperation to work with APC than with each individual producer. In this case, consumer cooperation organizations receive a reliable supplier of fresh fruit and vegetable products to load their capacities.

At the beginning of the twentieth century, V.F. Totomiants wrote that "for consumer cooperation, which wants to achieve the greatest results," agricultural cooperation should be promoted. He recommended that consumer societies become not only buyers of products, but also provide agricultural cooperatives with part of the money to expand production (Totomiants 1918, p. 328).

In recent years, public policy has focused on the formation of agricultural consumer and production cooperatives in rural areas. Various government programs and national projects are being developed to support these types of cooperatives. For example, the national project "Small and Medium-sized Enterprises and Support for Individual Entrepreneurship Initiative" includes the federal project "Farmers Support System and Rural Cooperative Development," which provides grant support to peasant farms and subsidies to agricultural consumer cooperatives (ACC). In order to increase interest in the unification of disparate rural producers into cooperatives, subsidies are provided for the reimbursement of part of the ACC costs associated with the sale of agricultural products received from members of such a cooperative and for the reimbursement of part of the ACC costs for the purchase of farm animals for members of ACC and agricultural machinery to provide services to members of ACC.

Taking into account local characteristics, the regions adopt their own normative acts of the same orientation. For example, the Republic of Ingushetia provides the following forms of support: grants from «Agrostartap» peasant farms to co-finance

Table 3 Gross collections of vegetables and fruits and volumes of harvests by organizations of consumer cooperation of the Central Union of Consumer Cooperatives, thousand tons

Indicators	Years						2019 to 2018, %
	2014	2015	2016	2017	2018	2019	
Open field and under glass vegetables							
Gross charges in farms of all categories, including	12,821	13,185	13,181	13,612	13,685	14,104	103.1
agricultural organizations	2554	2893	3076	3480	3581	3967	110.8
Peasant Farms	2089	2396	2381	2586	2559	2843	111.1
Domestic production	8179	7896	7724	7546	7545	7295	96.7
Purchased by consumer cooperation organizations	70.2	57.8	61.0	52.5	49.8	40.8	81.9
Coverage of purchases of produced products by all categories of farms,%	0.5	0.4	0.5	0.4	0.4	0.3	−0.1 pp
Coverage by purchases of manufactured products of peasant farms and households	0.7	0.6	0.6	0.5	0.5	0.4	−0.1 pp
Berries							
Gross charges in farms of all categories, including	2779.6	2676.1	3055.6	2682.6	3337.0	3500.0	104.9
agricultural organizations	645.8	628.2	784.6	729.8	1046.3	962.2	92.0
Peasant Farms	66.1	80.8	87.1	115.9	150.5	218.9	145.4
Domestic production	2067.7	1967.0	2184.0	1836.9	2140.2	2319.0	108.4
Purchased by consumer cooperation organizations	44.5	39.1	35.5	28.8	26.8	24.5	91.4
Coverage of purchases of produced products by all categories of farms,%	1.6	1.5	1.2	0.9	0.8	0.7	−0.1 pp

(continued)

Table 3 (continued)

Indicators	Years						2019 to 2018, %
	2014	2015	2016	2017	2018	2019	
Coverage by purchases of manufactured products of peasant farms and households	2.1	1.9	1.6	1.5	1.2	1.0	−0.2 pp

Source Compiled by the authors according to the FSSS and annual reports of the Central Union

part of the costs associated with the implementation of projects for the creation and development of peasant farms; subsidies for the reimbursement of part of the costs of the ACC in the framework of the creation of a system of support for farmers and the development of rural cooperation; Subsidies to the Centre for Competence in Agricultural Cooperation and Support to Farmers to co-finance the costs of ongoing activities.

One of the areas of grant support is «Agrostartap» grants for the laying of super-intensive apple orchards. Funds are provided both for the garden bookmark itself and in the case of using part of the grant funds for the formation of an indivisible ACC fund, of which peasant farms is a member.

However, state support for cooperatives in Russia is not enough to spread them everywhere. Modern market conditions require market participants to invest in the development of production, trade, logistics, information, advertising, warehouse areas of their activities. Banks are reluctant to lend to small producers, and the interest on the loan does not always suit the borrowers themselves. Therefore, the conditions for providing cash from a rural credit cooperative may be more favorable for cooperatives such as APC and ACC than in banking institutions.

The practice shows that the same peasant farms or the domestic household can be a member of the APC, ACC and a credit cooperative, which gives strength to the relations between these types of cooperatives located in a certain area. Such interdependence ensures transparency in cooperatives.

It should be borne in mind that all types of cooperatives have their own interests in the fruit and vegetable market. Therefore, APC produces fruits and vegetables and seeks to sell them. The ACC provides cooperatives with equipment, materials, energy resources, etc. Organizations of consumer cooperation purchase and process fruit and vegetable products. At the same time, they fulfill one task—to sell as many produced products as possible. Therefore, by combining monetary and material resources, cooperatives should develop a single plan of action on their territory, which will benefit all participants in integration.

The integrator can be a consumer society, guaranteeing the sustainable sale of fruits and vegetables by members of the APC. It can also provide funds for the future crop for the purchase of equipment, fuel, fertilizers and plant protection products. ACC can provide information support and advertising for both consumer society and APC. The funds of a credit cooperative can be claimed by any type of cooperative.

Interpenetration of the interests of various cooperatives is a good environment for business activity in rural areas, where after the 90s of the XX century practically no industrial production remained. In recent years, the arrival of chain stores in the countryside has been observed. This leads to the closure not only of consumer cooperation stores, but also of its production workshops, which does not contribute to the sustainable development of rural areas.

Combining the means and capabilities of cooperatives to build small sorting, processing and packing workshops for the processing of fruits and vegetables in the place of its production will not only reduce losses and increase the added value of products, but it will also create jobs for rural residents.

The sustainable development of the fruit and vegetable market implies a constant increase in its production. And although gross collections of both fruits and vegetables in Russia are growing, most of them remain out of the market. Therefore, the state should develop a mechanism that will allow the products grown in peasant farms and households to enter the market. In order to achieve it, not only agricultural, but also other types of cooperation should be supported (Sharkova et al. 2021, p. 416).

Market infrastructure should be developed as an integral part of improving the fruit and vegetable market, accelerating the path of products from producer to consumer. It is necessary to introduce various types of sales: stationary, delivery, portable stalls, etc. (Moustier and Loc 2016). Cooperation theorists noted that the development of peasant cooperation is «far from being done" that is needed to improve the lives of rural residents. They drew attention to the creation of the necessary infrastructure—railways, harbors and ships, international trade agreements, customs legislation protecting Russian manufacturers (Chayanov 1918, p. 120). There is also a need for a regulatory framework that provides for state support from the stage of production to stimulating consumer demand and is aimed at developing infrastructure elements of the market (Alieva et al. 2015).

The fruit and vegetable market includes: production, processing, marketing, consumption and recycling of waste. At the same time, producers should be mindful of the interests and preferences of the end user, for whom vegetables and fruits are grown (Tecco et al. 2016). The concept of sustainable development implies a special emphasis on economic growth through environmental, economic and social dimensions in order to preserve peace for future generations (Sharkova et al. 2020, p. 16).

4 Conclusion

Following the 2030 Agenda, which defines sustainable development as the interrelationship of the three dimensions—economic growth, social integration and environmental security, the authors determine the sustainable development of the fruit and vegetable market—Continuous growth in the sustainable production of vegetables and fruits, especially local crops, for food security, nutrition, safe and nutritious fruits and berries, ensuring abundant consumption of a variety of fruits and vegetables and

guaranteeing a stable livelihood and income of peasant farms, households, cooperatives, increased solvent demand for fruits and vegetables, integration of small-scale agricultural producers into global production and supply chains.

Co-operation of small producers and government regulation of the fruit and vegetable market allows a significant increase in the commodity mass coming to sale. The involvement of peasant farms and households in the market turnover will make it possible to reduce the dependence of the Russian market for fruits and vegetables on imported supplies. This can be considered a macro task of the state policy. At the same time, micro-tasks will be solved—increasing incomes of the rural population, creating jobs, increasing revenues to local budgets, improving living conditions in rural areas. As a result, the symbiosis of state and cooperative interests will make the fruit and vegetable market more stable.

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Diagnosis of the Quality of Scientific Publications in the System of Consumer Cooperation and Their Impact on Its Sustainable Development

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Abstract The purpose of the research is to develop a new method for diagnosing the quality of scientific publications in the system of consumer cooperation. Currently, such a metrological task as adequate diagnosis of the quality of scientific publications is given due attention; this was primarily due to the increasing importance of research activities in the modern world, including the scope of consumer cooperation; inevitably, what were the criteria for the success of research? The authors of this article analyzed the existing methods of diagnosing the quality of scientific publications. Based on the fact that scientific publication is a unit of research results (as a scientific quote is a unit of inter-scientific communications), the authors proposed their own method for diagnosing the quality of scientific publications, based on the mathematical theory of graphs and the theory of algorhythms (the idea of recurring calculations). The theoretical significance of the results of this research is in the possibility of further scientific understanding of such a problem as the effectiveness of research activities of a researcher, including a teacher at a higher educational institution of the consumer cooperation system and its impact on the sustainable development of the industry. A qualimetric approach (proclaims the need for a multi-criterion assessment of the quality of scientific audiences), a metasystem approach (considers a scientific quote as an independent "unit" of inter-scientific communication).

Keywords Scientific publication · Quality · Method · Consumer cooperation · Diagnostics · Graph theory · Recurrence calculation

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1 Introduction

Adequate assessment of the quality of scientific publications is by no means a rhetorical task. Firstly, without an adequate assessment of the quality of scientific publications, it is impossible to objectively diagnose the productivity of research activities of scientific workers, as well as the success in this activity of scientific teams and organizations, including universities (Bebenina 2018). Recall that productivity (efficiency) is estimated both by the volume of production and by the quality of products (in our case—intellectual products, i.e., the results of research activities).

Secondly, an objective analysis of applications for funded research projects, for receiving honorary titles in science, for creating scientific schools also require an adequate assessment of the quality of scientific publications. For example, when reviewing applications for funded research projects, scientific foundations often disapprove of them due to the inadequate level of publications that make up the "backdrop" of the declared project. It should also be borne in mind that the analysis of the implementation of the research project already supported also involves the diagnosis of the quality of publications corresponding to the topic of the project.

Thirdly, only high-quality research results can have methodological significance; recall that the methodological significance of the results of research activities is the possibility of their application in the content of training (Romanov and Drozdov 2018). It is also necessary to objectively evaluate the methodological activities of university teachers: if a teacher of a higher school effectively carries out a scientific search for the application of new and latest achievements of science in the content of education, then this, of course, is evidence of the high level of his methodological competence (and, at a minimum, the proper level of methodological activity).

Fourth, at present (in the conditions of a steady increase in the number of scientific publications), the problem of social responsibility of scientific publications (journals) is increasingly urgent; it was clear that such responsibility lay primarily in publishing articles at the appropriate level. Suffice it to say that in recent years alone, more than 300 journals have been excluded from the national science metrics base of the RSCI (Russian Scientific Citation Index); many works of various conferences were also excluded. It should not be forgotten that magazines claiming to be included in the list of HAC of the Russian Federation or, especially, in the core of the RSCI should publish articles of high and very high quality.

Fifthly, such a metrological task as objective diagnosis of the development of a subject scientific field (scientific or applied problem) is currently relevant. Obviously, the number of publications corresponding to the scientific field cannot be an adequate criterion for its development, since publications may be low. For example, if socially oriented behavior (including the activities of volunteers) is studied, then one article in the journal Questions of Psychology (included in the Web of Science), of course, cannot be replaced by ten middle-level articles.

Sixth, such a metrological task as the diagnosis of inter-scientific communications in the scientific community is currently becoming relevant. It is known that publication is a unit of research results, and scientific quotation is a unit of inter-scientific

communications. But the number of quotes cannot be an adequate criterion for inter-scientific communications. Currently, experts are increasingly talking about the fact that scientific quotes are unequal. Indeed, situations are possible when a researcher of low qualifications quotes the same low-skilled worker, possibly—vice versa. For example, a scientific article published in a journal with an impact factor of 0,08 can be quoted from a journal with an impact factor of 0,07, and an article published in a journal with an impact factor of 0,88 can be quoted from a journal with an impact factor of 0,77.

Seventh, the task of diagnosing the qualifications of a scientific worker is important. Currently, in addition to degrees and honorary titles, such a scientificometric indicator as the Hirsch index (h-index) is commonly known. However, modern studies have proved that the Hirsch index is easily manipulated (Zarubina 2018). An absurd situation arises: a researcher who managed with the help of fraudulent schemes to "twist" the citation of publications (not necessarily of a high level!), "Is" more qualified than a researcher with a smaller Hirsch index, but with rather better publications!

For example, a publication received ten quotes, but none of the quoting publications received social recognition, which cannot be considered a positive situation. Therefore, the most modern model for assessing the quality of publications takes into account the impact factor of the publication to which the analyzed publication is affiliated, as well as the height and width of the citation tree: $Q = (1 + C) \cdot (1 + N) \cdot \log_2(1 + M)$, where N is the number of citations for publication, M is the height of the citation tree, C is the impact factor of the publication (Tastes 2018). The height of the citation tree means the maximum degree of continuity in the development of scientific knowledge (such continuity is manifested in citation). However, this model does not take into account the impact factor of publications to which quoting publications are affiliated.

The question arises: can the degree of originality of scientific publication be a criterion for its quality? From the point of view of the authors of this article—no. Indeed, Russia is firmly committed to integration into the world community; with regard to scientific activities, the principle of "Zero tolerance to plagiarism" is known. The mandatory requirement of any publication is at least 70% of the originality of the text. But it is known that any criterion should have the proper differentiating ability, therefore, the degree of originality of scientific publication cannot be a "good" criterion for its quality.

It should be noted that assessing the quality of scientific publications and assessing their significance for the scientific community are different metrological tasks. The difference lies primarily in the fact that the evaluation of the quality of the publication involves both an assessment of the quality of the information material itself and its role in the continuous development of scientific knowledge (from which level of publication is the link?). Indeed, the same scientific article can be quoted from a high-quality publication, or from a low-level one. As for the assessment of the significance of the publication for the scientific community, in this case, it is more important than many authors who quoted the publication (for which number of scientists the publication is significant?), As well as their distribution in the wide

scientific community. Moreover, the authors of this article have previously proposed such a scientific-metric indicator as the geographical latitude index of the publication (Mendoza et al. 2018).

2 Methodology

According to the methodology and organization of research to achieve the goal, complementary research methods were applied: analysis of scientific literature, modeling, methods of qualification, methods of mathematical statistics, methods of set theory and relations, methods of algorithm theory and methods of graph theory (Reyes et al. 2018).

3 Results

According to the authors, when diagnosing the quality of a scientific publication, it is necessary to take into account both the rating (impact factor) of the publication to which it is affiliated and the quality of quoting publications. This is due to the following circumstances. Firstly, the publication (journal) is socially responsible, and it is impossible to equalize articles published in journals with low and high impact factors (i.e., having different authority in the scientific community). Secondly, publication (more precisely, the results of the study reflected in it) should have significance for the wide scientific community, i.e. for scientists. Thirdly, there should be continuity in the development of scientific knowledge: high-quality results reflected in the publication should be the basis for the subsequent production of high-quality research results; in other words, the quality of citation publications (not just their number!) should be important in diagnostics. Thus, diagnosis of publication quality cannot be reduced prior to citation evaluation.

The authors of this article propose a complex but accurate method for assessing the quality of a publication: $G = (1 + C) \cdot \left\{1 + \sum_{i=1}^{M} \left[\log_2(1 + g_i)\right]\right\}$, where M is the number of "truly external" quotes for publication, C is the rating (impact factor) of the publication to which the publication is affiliated, g_i—is the quality of the i-th quoting publication, calculated according to the same scheme as the quality of the cited (Khor and Yu 2016). The complexity of this method is that citation publications can also have "truly external" citations (references). In other words, the evaluation of the quality of the analyzed (diagnosed) publication becomes a recurring computational process. Obviously, the criterion for leaving recursion is the achievement of graph vertices that do not have input arrows. From the above formula it can be seen that in the absence of "truly external" quotes for publication, its quality $G = (1 + C)$. If the journal to which the diagnosed publication is affiliated does not have an impact factor (most often these are journals recently included in the science metric system),

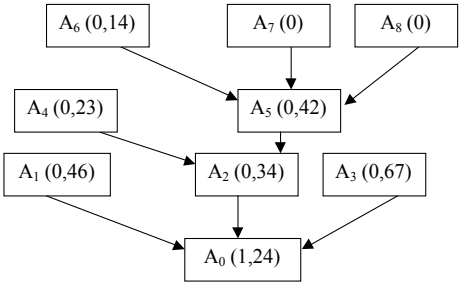

Fig. 1 Example of publication citation graph. *Source* compiled by the authors

then $G = 1 + \sum_{i=1}^{M} \left[\log_2(1 + g_i)\right]$. If both parameters (M and C) are zero, then the publication quality is minimal, equal to 1.0 (means the fact of its presence in the science-metric database).

Simplified publication quality assessment scheme: $G = (1 + C) \cdot (1 + M)$. The most simplified evaluation model: $G = 1 + M$, that is, the quality of publication is only 1.0 more important for the scientific community.

Firstly, the publications of a researcher should be of importance to a wide scientific community, and not a narrow range of scientists. Secondly, modern experts have proved that the "hard" and "flexible" Hirsch indices are fairly similar indicators (when calculating the "hard" Hirsch index, only "truly external" quotes for publications (Neustroev et al. 2018) are taken into account.

Let's give you an example. Figure 1 reflects the publication citation graph (the publication impact factor to which it is affiliated is indicated in parentheses). Let it be necessary to evaluate the quality of publication. A_0. Obviously, the quality of publications A_7 and A_8 is equal to 1, the quality of publication A_6 is equal to 1,14, publications A_4 − 1,23, publications A_1 and A_3—respectively 1,46 and 1,67. In this case, the quality of the publication A_5 is

$$g_5 = 1,42 \cdot \left(1 + \log_2(2) + \log_2(2) + \log_2(2,14)\right) = 5,818$$

The quality of the A_2 publication is

$$g_2 = 1,34 \cdot \left(1 + \log_2(2,23) + \log_2(6,818)\right) = 6,601.$$

The quality of the A_0 publication is

$$G = 2,24 \cdot \left(1 + \log_2(2,46) + \log_2(2,67) + \log_2(7,601)\right) = 14,877.$$

On publication A_0 there are three "truly external" quotes. If you calculate the quality of publication A_0 using a simplified scheme, then $G = 2,24 \cdot (1 + 3) = 8,96$. If you do not take into account the impact factor of the publication, but only the number of "truly external" quotes, then $G = 1 + 3 = 4$.

The method of evaluating the quality of publications proposed by the authors of this article is a step forward compared to the method proposed by modern specialists

(in the work (Saprykina 2018)). The fact is that the already existing method is based on "rude" accounting for the height of the citation tree, and also does not imply accounting for the rating of publications (especially, it is impossible to take into account the rating of citation publications). But it was modern experts who raised the question that when diagnosing publications, it is necessary to take into account the continuity in the development of scientific knowledge, and in this—their merit.

It should also be noted that the proposed method of diagnosing the quality of publications involves strict affiliation to a specific scientific-metric system (Tolstova 2018). For example, if a Russian magazine is included in the international Scopus system, then when assessing the quality of articles published in it, the impact factor of this journal according to the RSCI is taken into account, as well as links indexed precisely in the RSCI.

4 Conclusion

From the point of view of the authors of this article, it is the new integrative criterion for the quality of scientific publications that will reveal the results of research activities that can and should be applied in practice in consumer cooperation in the content of training, as well as really promising scientists (and not at all on the basis of the Hirsch index). According to the method of rocky showering (it is on its basis that the h-index is calculated), the productivity of a researcher is N, if at least N of his publications have the quality of at least $f(N)$ each. Simplest kind of function: $f(N) = N$.

Therefore, at present there are many ways to diagnose the quality of scientific publications; the most advanced of them are based on modern mathematical methods.

From the point of view of the authors of this article, it is necessary to create a domestic rating methodology that allows assessing the presence of the university in the scientific community (just as the Webometrics methodology assesses its presence in the Internet space). The core of this methodology should be the assessment of the quality of publications of scientists in the RSCI.

Prospects for further research are the study of the success factors of research activities of researchers and consumer cooperation teams (the author's criterion is the total level of quality of scientific publications of the subject of research activity).

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Analytical Apparatus of Research on the Sustainability and Manageability of Economic Facilities of the Cooperative Sector (Within the Framework of Public–Private Partnership)

Nickolay T. Katanaev, Natalia A. Volkova, Tatyana A. Panteleeva, Sergey M. Kuleshov, and Mikhail Yu. Bykov

Abstract The work determines that the validity of mathematical descriptions of processes occurring in economic objects depends to a significant extent on the class of functions chosen for identification. First of all, this applies to descriptions of processes that change over time. The most appropriate class is determined by the class of exponential functions on which analytical solutions of differential equations are based, which are the theoretical basis for studying the stability and controllability of objects. As the most effective tool for such analysis, the article considers mathematical models that make it possible to establish functional connections of external and internal factors with key indicators of the production activities of economic actors, which include cooperative communities of individuals and organizations. The reliability of the results of identification of economic processes in different classes of functions is analyzed. Features of simulation of cyclic, divergent and convergent processes based on statistical data using polynomial, exponential and other functions are disclosed. The use of the developed apparatus allows, on the basis of the classical theory of stability of systems, to investigate the intrinsic stability of economic objects of the cooperative sector and to identify the dependence of the forced movement of the object on external macroeconomic factors. The problem to be solved involves the involvement of fundamental theoretical research and is relevant at all stages of economic development.

Keywords Sustainability · Manageability · Crisis modeling · Identification · Industrial cycle

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1 Introduction

State-owned enterprises, as well as private communities, which form the basis of the country's economy, depend to a significant extent on both domestic economic policies and external factors that determine the development path and growth rate of their goods and services (Bulow et al. 1985; Levshin and Ponomarev 2009).

At the present stage of development of the Russian economy maximum attention is paid to support of large industrial structures, which ensures reduction of the resulting COVID-19 unemployment and creation of new jobs (Sycheva et al. 2019; Vrazhnova et al. 2019). One of the most effective methods, the authors of the article see the strengthening of the public–private partnership sector. The main advantage of such enterprises is to increase investment attractiveness and create a basis for the implementation of innovative projects (Amirova et al. 2018). The most common formats in the Russian Federation are public–private enterprises and government contracts (Panteleeva et al. 2021a; Stadnik et al. 2015).

The current policy of rebuilding the destroyed domestic economy should be comprehensive. Mathematical models that allow functional linkages of external and internal factors with key performance indicators of economic actors, including cooperative communities of individuals and organizations, can be an effective tool for such analysis (Andreasson et al. 2016; Beaudoin and Swartz 2018; Cournot 1838).

The problems of analysis of stability and manageability of economic objects occupy a special place in research using these models (Dudin et al. 2015; Goloshchapova et al. 2018; Panteleeva et al. 2021b). At the same time, an important point in designing a model is the requirement of a high degree of its adequacy to the real process.

The importance and relevance of solving these scientific and practical problems is undeniable. Successful work in this direction can identify problematic places in the management of business processes in the economy and eliminate them as soon as possible.

2 Methodology

The models proposed in this article are based on functional and statistical links, as well as on dynamic models that allow assessing the stability and manageability of processes taking place in economic facilities.

Obtaining statistical models is not particularly difficult. One of the widely known tools is the Excel spreadsheets implemented in almost every computer, with which you can identify the statistical process in various classes of functions.

In solving practical problems, polynomial identification is most often used. Models developed with a high correlation coefficient are usually used in interpolation and extrapolation of the investigated process, without going into the details associated in some cases with obtaining dubious results.

3 Results

Here is an example of what errors this modeling approach can lead to. As an illustration, let us consider the results of the identification of quarterly GDP growth, which in the first quarter of 2000 year amounted to 1697 billion rubles. We take this value as the baseline used to describe the process of GDP growth in relative units. Real GDP growth is shown in the graph of Fig. 1 in the range from the first quarter of 2000 to the fourth quarter of 2004 (in order of order it is presented as the 20th quarter).

For the purity of the calculation experiment, this time range was chosen on the basis that during this period there was no acute phase of the crisis in the economy and external factors were not so critical as to cause significant jumps in the economy, the accounting of which could complicate the mathematical description of the study process.

Identification is carried out using a polynomial of the third degree, but in the first case we will choose the interval from 1 to 18 and get a polynomial of type 1 (see Fig. 1). In the second case, select the interval from 1 to 15 (polynomial 2). Correlation coefficients in both cases were higher than 0.96. It would seem that both polynomials can be used in interpolation and extrapolation procedures (when predicting upcoming events). However, we see that when extrapolating the process for the 25th quarter, the

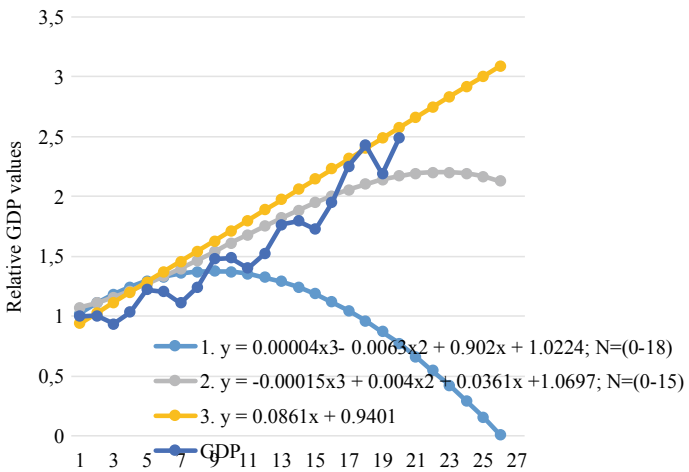

Fig. 1 Polynomial identification of GDP between 2000 and 2005. *Source* Compiled by authors

estimated values are divergent. Their directions of motion are determined by signs of coefficients with the variable $\times 3$. In this case, the linear identification results (Eq. 3 in Fig. 1) were more reliable.

As for interpolation, none of the polynomials reproduces the process of quarterly change in GDP indicators, which has a periodic nature with an increasing amplitude.

These (but not complete) disadvantages are characteristic of statistical models that are devoid of physical meaning and formalized under a certain class of functions. Changing any factor changes the parameters of the entire structure. These disadvantages prevent their use as simulation models.

The construction of functional-statistical models is based on a disjunctive process, when a complex phenomenon consists of relatively simple events. It to some extent coincides with the superposition principle widely used in technical cybernetics (the principle of independence of the influence of inputs—factors that affect the system), which makes it possible to summarize these influences.

An example is the functional and statistical models of gross domestic product (GDP), money supply (aggregate M_2) and the number of revolutions V of money supply for the same period as in the previous example, starting in 2000, obtained from the statistics presented in Table 1 in the form of absolute and relative indicators normalized with respect to their maximum values.

Changes in the above indicators were considered as certain processes identified in various classes of functions, from which functional and statistical models were formed, presented together with the graphs in Fig. 2.

Comparison of theoretical and statistical data makes it possible to make sure that the results of identification of the studied processes match well. Such models make it possible to create an apparatus for investigating problems related to the stability and manageability of economic objects.

The presence of a harmonic component in the model makes it possible to reproduce periodic processes with a varying amplitude of vibration. In addition, the identification of the main trend of events by exponential functions gives information about the convergence of the studied phenomenon, which depends on the sign of the exponent indicator.

Solution convergence analysis is usually performed at $t \to \infty$. In this case, the positive sign of the exponent indicator gives a divergent solution, indicating that the system is unstable. Negative value is related to attenuation of dynamic process characteristic of stable systems, at that the investigated factor reaches its specified value, or tends to zero.

Thus, the intrinsic component of the solution of the differential equation is identified, the obtaining of which causes great difficulties. However, it should be borne in mind that in this case the intrinsic stability of the system is determined.

The forced component of the solution is related to the nature of the external impact on the system. In the system dynamics equation, external influences are written on the right side of the differential equation.

If the system has its own stability, then it is controlled and, depending on the nature of the effect on the system, it can lead to a given state of controlled coordinates. This coincides with the conventional definition of controllability, which assumes the

Table 1 *GDP*, M_2 and *V*, presented in the form of absolute and relative indicators obtained between 2000 and 2005

№	Absolute indicators			Relative indicators		
	GDP (trillion. RUB)	M_2 (billion. RUB)	V	GDP	M_2	v
1	2	3	4	5	6	7
0	1696.6	850.1	2	1.0000	0.2724	0.1569
1	2037.8	977.6	2.08	1.0400	0.3272	0.1805
2	2043.7	1054.6	1.94	0.9700	0.3281	0.1947
3	1900.9	1118.5	1.7	0.8500	0.3052	0.2065
4	2105	1242.6	1.69	0.8450	0.3380	0.2294
5	2487.9	1374.5	1.81	0.9050	0.3995	0.2537
6	2449.8	1448.2	1.69	0.8450	0.3933	0.2673
7	2262.2	1532.8	1.48	0.7400	0.3632	0.2830
8	2528.7	1700.2	1.49	0.7450	0.4060	0.3139
9	3012.8	1824.3	1.65	0.8250	0.4837	0.3368
10	3026.9	1943.9	1.56	0.7800	0.4860	0.3588
11	2851.1	2114	1.35	0.6750	0.4578	0.3902
12	3101.7	2447.2	1.27	0.6350	0.4980	0.4518
13	3600.2	2695.3	1.34	0.6700	0.5781	0.4976
14	3655.2	2835.2	1.29	0.6450	0.5869	0.5234
15	3515.7	3323.5	1.06	0.5300	0.5645	0.6135
16	3971.6	3514.9	1.13	0.5650	0.6377	0.6489
17	4594	3649.8	1.26	0.6300	0.7376	0.6738
18	4945.9	3928.5	1.26	0.6300	0.7941	0.7252
19	4458.6	4300.6	1.04	0.5200	0.7159	0.7939
20	5077.9	4677.7	1.09	0.5450	0.8153	0.8635

Source Bulletin of Banking Statistics of Russia, Central Bank of the Russian Federation

presence of such controls that transfer an object from one point of phase space to another over a finite period of time.

A system that does not have its own stability is unmanageable. As a rule, system instability is determined by the presence of positive feedback (structural instability), or by an unsuccessful relationship of its parameters (parametric instability) (Pilnik et al. 2014; Sycheva et al. 2018).

Such a system stability analysis technique is very useful in the event of significant difficulties in obtaining a process dynamics equation describing the movement of the system over time.

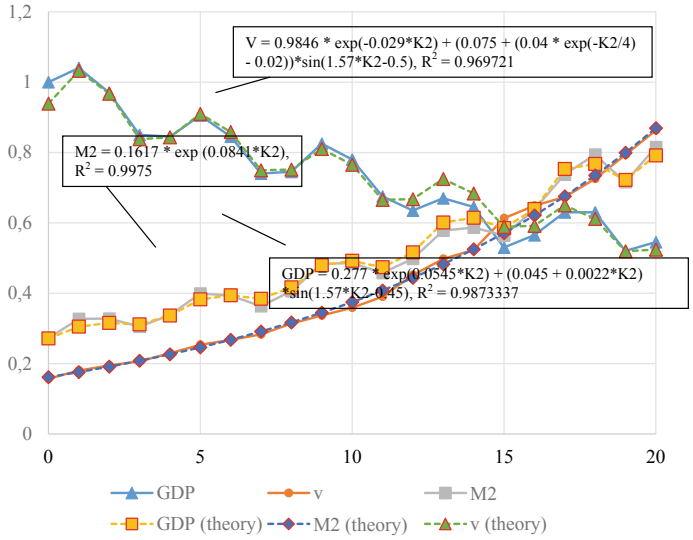

Fig. 2 Identification of GDP, M_2 and V between 2000 and 2005. *Source* Compiled by the authors

4 Conclusion

Therefore, conducted computational and theoretical studies of the stability and controllability of economic objects make it possible to formulate the following conclusions:

1. According to the authors, the Russian Federation has created a basis for the progressive development of public–private partnerships. Close interaction between business and the state implements a synergistic effect. Lobbying the interests of large cooperative enterprises creates the prerequisites for attracting investment and forming innovative clusters, which, in the context of a general reduction in costs, reduces the impact of macroeconomic risks.
2. The validity of mathematical descriptions of processes occurring in economic objects depends to a large extent on the class of functions chosen for identification. First of all, this applies to descriptions of processes that change over time. For them, the most suitable is the class of exponential functions on which analytical solutions of differential equations are based, which are the theoretical basis for studying the stability and controllability of objects.
3. The sectors of the real sector of the economy are inherently sustainable and manageable. Their own component of the analytical solution of the dynamic model has a convergent solution, characteristic of stable systems that make a forced movement to a given external action factor to the desired point (or to a certain state).
4. The conducted studies create a theoretical basis for the subsequent study of the peculiarities of the organization of external control influences with a given

target function (destructive or creative). This knowledge can be very useful in shaping the policy of economic development of the Russian Federation.

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Inflation Volatility as a Structural Problem of Sustainable Development in Pandemic Conditions

Marina A. Skvortsova, Elena V. Zotova, Irina V. Dragunova, and Maria M. Malyasova

Abstract In recent decades, the problem of regulating inflationary processes in the context of the formation of a model of sustainable development of the economic system has been given special importance. The studied international experience in the development of inflation theory made it possible to form a system of views on inflation as a problem of sustainable economic development. The authors of this research believe that the issue of the impact of inflation volatility on sustained economic growth is quite relevant and is significantly exacerbated by the problem of the corona-virus pandemic. As part of the research, the authors focused on identifying the relationship of inflation volatility with economic indicators of sustainable development of the Russian Federation. The main method of the study was correlation-regression analysis. Practical implementation of the above methods was carried out using the statistical application "Statistica 10.0." It was concluded that when developing a strategy for the sustainable development of the system, it is advisable to determine the dependence of the volatility of the consumer price index on the key rate of the Central Bank, GDP growth rates and the volume of the money supply. The constructed regression model sufficiently confirmed the hypothesis put forward by the authors regarding the impact of inflation volatility on the sustainable development of the Russian Federation.

Keywords Inflation · Volatility · Sustainability · Factors · Correlation-regression analysis

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1 Introduction

The transition from the concept of economic growth to the concept of sustainable economic development required a rethinking of some approaches related to the assessment of inflationary processes and their regulation. In the Russian economy, when the authorities conduct monetary actions, there is no clear understanding of how inflation volatility affects economic growth. Comparing the effect of inflation and its volatility will make it possible to establish emerging imbalances and assess the dependence of inflation and sustainable economic development.

In recent decades, the problem of regulating inflationary processes in the context of the formation of a model of sustainable development of the economic system has been given special importance. In the empirical works of economists Perevyshin (2015) (The Impact of Inflation on Economic Growth 2015), Polterovich and Popov (2016), there is a connection between inflation and long-term growth. However, even empirical calculations, not to mention the theoretical assumptions put forward, do not allow us to draw conclusions about the nature of this impact, as noted in their study Das and Loxley (2015), Eggoh and Khan (2014). Studies suggest that more volatile inflation leads to variations in household consumption and has a detrimental effect on economic growth. In this regard, we consider the issue of the impact of inflation volatility on sustained economic growth to be particularly relevant at present and insufficiently investigated.

2 Materials and Methods

The inflationary processes taking place in the country signal how the economy is currently functioning. Therefore, government agencies analyze in detail the volatility of inflationary processes. The methodology for measuring inflationary processes is based on international standards adopted by the EU Statistical Service, IMF, OECD, and the World Bank.

An important point in the study of inflationary processes is the identification of the degree of interaction between various economic indicators and the level of inflation. For these purposes, it is used as the main correlation-regression analysis, which allows you to study in detail the relationships between processes according to Shikhalev (2015).

To date, various application packages are the main analytics tool for multidimensional factor analysis. The first stage of correlation-regression analysis involves the definition of a database for conducting a study of the relationship between indicators. At the next stage, a hypothetical model is formulated that allows you to determine the form of the connection and describe the relationships between the variables used

in the proposed model. Considering the fact that several factor features influence the effective indicator at the same time, it is advisable to measure the degree of tightness of communication of the effective indicator with each of the independent features, while excluding the influence of other factor features, as noted in his works by Sokolov (2016), Ayvazyan et al. (1989).

As part of our research, we focused on identifying the relationship of economic indicators of the sustainable development of the Russian Federation with indicators of inflation volatility. The main method of the study was correlation-regression analysis. Practical implementation of the above methods was carried out using the statistical application "Statistica 10.0."

3 Results

Currently, a fairly large amount of empirical data has been collected on the facts of the impact of the volatility of inflationary processes in Russia on economic growth. In this regard, the importance of conducting a comprehensive analysis and identifying the relationship of inflation volatility with various economic indicators of sustainable development is growing. Correlation-regression analysis is useful for identifying the relationship between economic indicators of sustainable growth and assessing the degree of influence of selected criteria on inflation. For the purpose of the research, the authors selected factors such as the key rate of the Central Bank (x1), GDP growth rate of the Russian Federation (x2), export volume (x3), import volume (x4), direct investment volume (x5), industrial production index (x6), unemployment rate (x7), USD/RUB rate (x8), average annual price of Urals crude oil (x9) and the volume of the money supply (x10).

Data taken from the website of the federal state statistics service of the Russian Federation, as well as the Central Bank of Russia, were used as a database. Baseline information for the construction and evaluation of the multifactor regression model includes data for the period 2009–2019.

The change in prices in the Russian market is measured using such an indicator as the volatility of the consumer price index—yi. We will form a hypothesis as to what factors influence the volatility of inflation in the Russian market of goods and services. To achieve this, we construct a matrix of paired correlation coefficients (Table 1).

These tables make it possible to conclude that the closest connection is observed between the effective indicator (consumer price index—yi) and the key rate—×1, as well as the volume of the money supply—×10. According to the Cheddock Scale, the relationship between indicators ranging from 0.5 to 0.7 is recognized as noticeable.

Comparison of pairwise correlation coefficients shows that the monetary mass volume index is closely related to the unemployment rate—×7 and the exchange rate USD/RUB—×8, since the correlation coefficients of these factors are more than 0.9, there is a multi-collinearity between them, which allows us to conclude that these coefficients cannot be simultaneously included in the regression model.

Table 1 Pairwise correlation coefficient matrix

Indicator	y_i	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10
y_i	1										
x1	−0.66	1									
x2	−0.14	−0.29	1								
x3	−0.10	−0.02	−0.26	1							
x4	−0.20	−0.22	0.41	0.46	1						
x5	−0.11	−0.11	−0.10	−0.71	−0.63	1					
x6	−0.19	−0.12	0.03	0.29	0.50	−0.29	1				
x7	0.37	−0.03	0.75	−0.54	−0.03	0.08	−0.25	1			
x8	−0.33	−0.01	−0.66	−0.25	−0.55	0.68	−0.06	−0.62	1		
x9	0.12	0.01	0.29	0.77	0.72	−0.90	0.37	0.03	−0.78	1	
x10	0.50	−0.057	−0.671	0.173	−0.122	0.295	0.155	−0.898	0.855	−0.39	1

Source Compiled by the authors

Since the volume of the money supply—x10 has a stronger connection with the effective indicator yi (0.5), the unemployment rate indicators—x7, and the exchange rate USD/RUB—x8 can be discarded. In addition, an indicator reflecting the price of Urals—x9 crude oil can be excluded, since there is a linear relationship between it and the volume of direct investment—x5. In the multi-regression model, it is advisable to include the volatility of the consumer price index as an effective indicator, and the key rate, GDP growth rate, exports and imports, direct investment, industrial production index and money supply as factors.

According to Table 2, the resulting regression model is:

Table 2 Parametric characteristics of the regression model

Factor	Coefficients	Standard error	t-statistics	P-volume	Lower 85%	Higher 85%
Y—transverse	115.99371	14.51889	7.98916	0.00409	95.33877	136.64865
x1—Key interest rate	−0.51379	0.23570	2.17989	0.11736	0.17848	0.84910
x2—GDP growth rate	−1.16068	0.47446	−2.44634	0.09198	−1.83565	−0.48571
x3—Export volume	0.00059	0.00895	0.06614	0.95143	−0.01214	0.01332
x4—Import volume	0.02640	0.02085	1.26610	0.29486	−0.00326	0.05607
x5—Direct investment volume	0.00019	0.00015	1.21534	0.31116	−0.00003	0.00041
x6—Industrial production index	−0.01749	0.15505	−0.11278	0.91733	−0.23806	0.20309
x7—Money supply M2	0.00036	0.00011	−3.37848	0.04314	−0.00051	−0.00021

Source Compiled by the authors

$$y = 115.99 - 0.51x_1 - 1.16x_2 - 0.00036x_3.$$

According to the data shown in Table 2, the regression coefficient b1 = −0.51 suggests that with a 1% increase in the key rate, inflation volatility decreases by an average of 0.51%. The regression coefficient b2 = −1.16 shows that a decrease in inflation volatility by an average of 1.16% provides GDP growth of 1%. The regression coefficient b7 = −0.0003 shows that with a 1% increase in money supply, inflation volatility increases by an average of 0.00036%.

The correlation coefficient calculated during the study (0.944) indicates a strong relationship between the volatility of the consumer price index and the various factor characteristics included in the analysis. The resulting regression equation is considered statistically significant and reliable (Frach (3.53) > Ftable (2.21)).

Thus, the constructed regression model sufficiently confirms the hypothesis put forward earlier by us regarding the impact of inflation volatility on the sustainable development of the Russian Federation, reflected in the study as an indicator of GDP growth rate.

4 Discussion

The analysis conducted in the article confirms the fact that sustained economic growth is dependent on inflation volatility. Today, pandemic conditions impose an additional imprint on the development of volatility, the amplitude of fluctuations of this indicator in 2020 in the Russian Federation is 50%. However, this situation does not yet require a response from the Central Bank of the Russian Federation, since inflation reached historical lows in Russia last year.

The comprehensive study concluded that for countries with a high level of state participation in the economy, including Russia, when conducting monetary actions by the authorities, there is no clear understanding of how inflation volatility affects the sustainable development of the economy. The business activity of many countries of the world was disrupted by the pressure of a pandemic, which spread throughout the countries and caused devastating economic, social and environmental consequences.

In our opinion, a significant drawback of modern models of the influence of inflation volatility is that they do not analyze the specific characteristics of countries, on which the direction and degree of influence of both inflation and its volatility on the sustainable development of the economy can depend.

It is important to note that the inflation rate of the Russian Federation for many years differs significantly from the indicators of foreign ones. Prices for goods in the United States, China and the European Union are rising more slowly than in Russia, and the situation with inflation is more stable. For decades, it was Russia that experienced record-high inflation rates. As for China, the United States and the Eurozone, that could see slight fluctuations in the inflation rate at an average of 1–4%. The Russian Federation has been able to approach these indicators only in the

past few years, which cannot but be noted as a successful step in the fight against inflation.

The relatively low inflation rate in these countries is due to the fact that their inflation is exported. As for Russia, this is not the case, since Russia cannot export excess money to other countries.

The main instruments of monetary policy of foreign countries were the reduction of key interest rates, additional buyback of bonds, easing reserve requirements, as well as the provision of additional short-term liquidity through repo transactions.

Analyzing the monetary and anti-inflationary policies of foreign countries and the Russian Federation, we can see similar ways of regulating inflation. All measures used by countries are aimed at maintaining price stability, and ways to achieve this goal include managing the interest rate, applying reserve requirements for commercial banks, establishing a norm of mandatory reservation according to Ibarra and Trupkin (2016). However, at the moment there is a high inflation risk for each country due to the weakening of world economies amid the 2020 crisis.

In this regard, comparing the effect of inflation and its volatility will make it possible to establish emerging imbalances and assess the dependence of inflation and the sustainable development of the Russian economy. When developing a strategy for the sustainable development of the system, we consider it advisable to determine the dependence of the volatility of the consumer price index on the key rate of the Central Bank, GDP growth rates and the volume of the money supply.

5 Conclusion

In the course of the research, the authors concluded that the inflationary processes taking place in the country signal how the economy is currently functioning. Therefore, it is advisable to constantly monitor the volatility of inflationary processes.

There are various methods and indicators that allow you to determine in which direction inflation processes are developing. These include the calculation of the consumer price index, the calculation of the producer price index, as well as the deflator of domestic gross product, and the use of the correlation-regression method to identify the dependence of inflationary processes with various economic indicators.

A correlation-regression analysis was conducted to identify the relationship between economic indicators of sustainable growth and to assess the extent to which selected criteria affect inflation. Data taken from the website of the federal state statistics service of the Russian Federation, as well as the Central Bank of Russia, were used as a database.

The correlation coefficient obtained from the calculations made it possible to conclude that the relationship between the volatility of the consumer price index and factor signs is characterized as quite high and close to close. The resulting regression equation is considered statistically significant and reliable. Thus, the constructed regression model sufficiently confirms the hypothesis put forward earlier by the

authors regarding the impact of inflation volatility on the sustainable development of the Russian Federation, reflected in the study as the GDP growth rate.

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American and Western European Variants of Dyad and Triad Educational Models as Potentials for International Cooperation in Sustainable Development of Education

Anna V. Popova and Mikhail S. Galiev

Abstract Cooperation as a factor in the successful association of people holds a strong position in the field of education. It is well known that current education and psychology use generational theories. Nowadays, the modernization of the educational system has become an urgent necessity, including the fact that Generation Z has changed views, values, and life priorities. Like any science, education, under the conditions of sustainable development of knowledge, information, and technology, acquires new methods, models, and ideas of implementing the educational process and upbringing. Discussing the issue of the professional and personal trajectory of the learner's development, as well as options and ideas for transition and to fundamentally new individual learning technologies, the authors consider American and Western European versions of the dyad and triad educational models, thus defining possible options and ways of international cooperation in obtaining new and meaningful knowledge for their further use in educational organizations of consumer cooperation. The authors conclude that regardless of the educational models, there is a necessity for educational conditions aimed at forming and developing the child's competitiveness and professional trajectory.

Keywords Educational science · Dyad · Triad · Learner · Progressive education · Methods · Progressivism

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1 Introduction

> The main thing for a person is to understand his destination, his vocation.
>
> Everyone has their potential. And you have to strive to realize it. You have to develop your abilities.
>
> A. S. Zapesotsky.

Current and future state and legal development, based on the digital economy and the knowledge society, sets the corresponding tasks for education to prepare graduates with an inner culture, professionalism, competence, creativity, self-discipline, and tolerance. Such qualities can be formed only by creating an appropriate educational environment that helps to reveal the existing potential of the learner following socially recognized moral and cultural values. Therefore, knowledge of the methodological nature of the concept of "learner potential" and, on its basis, the creation of a system of its educational support is an essential part of the entire educational process.

Modernization of the educational system has become urgent because Generation Z has changed views, values, and life priorities, which, in turn, entails a different interpretation of the content of planning the future professional and personal trajectory. Questions of the need to form a personal trajectory, its methods, techniques, and ways are of interest in various fields of knowledge, ranging from psychology to economics. In the 2018 Annual Address of the President of the Russian Federation to the Federal Assembly of the Russian Federation, V. V. Putin noted that "it is necessary to move to fundamentally new individual learning technologies to instill from an early age a readiness to change, conduct creative searches, cooperate in teamwork, and live in the digital age, which is essential in the current world.

2 Methodology

The solution of the research problems of the designated topic is based on the use of hermeneutics—the interpretation of variants of the dyad and triad of educational models in system analysis and the context of international cooperation in the sustainable development of education. The research is also based on the dialectical method of knowledge, reasoning about the forerunners of the triad of educational models.

3 Results

Discussing the issues of professional and personal trajectories of development, as well as options and ideas for the transition to fundamentally new individual learning technologies, we should consider American and Western European variants of the dyad and triad educational models.

The forerunner of N. Cambron-McCabe and J. Dutton's triad of educational models was the theory of binary educational approaches widely used in the early years of Soviet power and J. Dewey's pragmatic theory of the learning process of the first third of the twentieth century. Within the framework of this theory, based on the analysis of the interaction or antagonism of the learner in the educational environment, J. Dewey distinguished two sections. In terms of their substantive features, these sections can be correlated with the transmissive and generative education of the early twenty-first century (Cambron-McCabe et al. 2000).

The first section says that the educational system must, for the good of the child, "ignore and diminish the individual characteristics (the personality core of the learner), quirks, and experiences of the child to give correct and stable placed realities, which can only be formed in those subjects taught in the classroom (Frumin 1998).

The second section embraces creating all conditions for the development of a child. Thus, J. Dewey notes that all academic subjects "must serve his (child's) growth. They are only tools of value insofar as they serve this purpose. Personality and character are more important than school subjects (Dewey 1922). Therefore, the main component is the rule that the quality and quantity of learning should be determined by children themselves, and not by the curriculum, which has a general, universal nature applying to all children regardless of their personality core. The only correct method is the one that traces the attainment of the mind and its capacity for assimilation."

The idea of overcoming the extremes of binary educational approaches was close to J. Dewey, who became the creator of a new educational trend—progressivism. In assessing this trend, K. B. Kornetov notes that it was based on the ideas and approaches of generative education. It oriented the teacher to recognize learners as the center of the educational process and create conditions for the constant acquisition of new experiences during active independent cognition of the world and themselves in this world. The criterion for the value of the entire educational system should be the extent to which it can create in learners the desire and opportunity for personal, ongoing growth and provide the means for this desire and opportunity to become self-fulfilling. However, it is necessary to remember that personal growth is impossible without "change," and the educator's task is precisely to help adjust it in the way necessary for the individual to build a free democratic society.

Education, based on the American notion of the "school that learns," (McLaren 1989) is defined not as a system of ways and methods of delivering information to learners but as "the art of teaching young people." Therefore, everyone participating in this process has the right to call themselves educators (Gergen 2009).

According to D. Dewey, the difference between these two sections is that the first one is marked with (1) discipline, (2) logic, (3) the need for a good education for teachers, (4) the guidance and control of the teacher over the learner, (5) legality as the basic principle of the educational process, and (6) the use of accumulated experience of all prior knowledge. The essential features of the section "the interest of the learner" are (1) the consideration of individual psychological characteristics of a learner, (2) sympathy for children and knowledge of their instincts, (3) the provision

of freedom and initiative in performing tasks and independent work, (4) immediacy and the ability to adjust the learning process for each individual, and (5) the ability to quickly change the content of the educational discipline based on everything new, changing, and progressive.

In the book "Schools That Learn: A Fifth Discipline Fieldbook for Educators, Parents and Everyone Who Cares About Education," N. Cambron-McCabe and J. Dutton (Cambron-McCabe et al. 2000) proposed a triad of educational models of learning. This triad in its totality and various models of transmissive, generative, and transformative education correlates with the entire educational practice of society and can be extended not only to schools but also to institutions of higher education. American educators proposed several models:

(1) The model of "transfer of learning" is based on the technique of simple transfer of knowledge from a teacher to a learner, when the former takes an active position, and the latter is placed in the position of passive listeners utterly dependent on the teacher. In our deep conviction, it is impossible to "transfer" knowledge (unlike information), because it is independently assimilated information analyzed and turned into knowledge at the individual level.
(2) "Active learning" should be used in most of the practices of theoretical learning in the classroom, as well as the professional and practical development of learners. According to this model, a teacher and a learner occupy equal active positions in the learning process. The teacher uses the methods of active learning through inquiry, cooperative learning, etc.
(3) The model of "transformative learning," "effective learning," and "critical learning (Yarkova 2012)" is based on the second model. Nevertheless, the goal of transformative learning is to implement the acquired competencies not only to get an assessment within a particular academic discipline but also to create a new reality. Based on the theory and practice of critical learning, transformative learning with the right didactic system, according to N. Cambron-McCabe and J. Dutton, can give learners the tools to change individual life and society as a whole.

The authors of the American interpretation of the content of educational models connect everything to issues of power. "The transfer of learning takes power from the learner and the teacher. Active learning gives teachers and learners the power to connect with the subject and build on their knowledge. These types of learning can provide the learner with functional literacy to fit the world. Transformative learning gives functional literacy to learners and provides teachers and learners with social or systemic literacy that empowers them to create their desired future" [6; 7]. They argue that even listening to a lecture can captivate the learners so that they will not take a passive position if the lecturer tells it vividly and interestingly, communicating their own attitudes and beliefs.

In 2013, (Gary 2016) published his study in which he suggests using the terms "formal" and "progressive" education, pointing out that it is necessary to understand the true meaning of "education" and "upbringing," literally meaning "to bring out." That is, the task of the educational process is to (1) discover in a pupil or student all

their capabilities and hidden talents using the entire set of knowledge and experiences accumulated by previous generations, help them to acquire new skills and abilities and, bring them to a perfect "new" based on the "old" without discarding the best of it.

T. Gary believes that the main issues that represent the central problematics of the educational process are as follows:

1. Definition of knowledge and skills;
2. Identification of knowledge and skills to be transmitted to the new generation;
3. Determination of the form and means for transmitting knowledge and skills.

The author discusses whether it is necessary to transmit only customs and cultural traditions constituting the bonds of a particular nation and its spiritual values developed over the centuries so that the learners, "absorbing" them, create new knowledge corresponding to current reality themselves.

T. Gary uses the definitions of formal and progressive education to identify the two main opposing schools of thought. He distinguishes between them in the following three ways:

1. What is knowledge, and is there a precisely defined part of it that must be carefully preserved and passed on as immutable truths to the next generation, or does knowledge acquire its content specificity only when obtained as a result of intensive independent work of the learner?
2. What is learning in the broad and narrow senses? Do the goals of learning differ depending on the taught discipline? What is more important for the learner—to obtain the necessary knowledge, skills, and abilities or learn to analyze and make decisions independently according to the changing situation?
3. How should the new generation be treated? Is it necessary to recognize them as individuals "with innate abilities" and allow "their differences to contribute in various ways to the tradition of the state, including all the spheres of which they are a part," without interfering or correcting their individual development, or to assume them as original members of society and, as such, give them the knowledge and skills necessary for life in society?

The answer to each of these questions is evident for T. Gary. He advocates only progressive education, considering himself a follower of J. Dewey in this area. In his opinion, "the formalist approach has always revolved around notions of education as a transmission of information. From the formalist perspective, culture and civilization are a treasury of ideas that must be passed on to the next generations. The transfer of ideas is carried out by the teacher. This process of transfer is education. While progressive educators emphasized the need to develop the child's inner potential, the formalists insisted on education from the outside—immersion in knowledge, ideas, theories, ideas about culture, society, and civilization."

The contradictions between the two types of learning are as follows:

1. Progressive education believes that its goal is to develop the individual's ability to think critically. Thus, everything should be focused on teaching individuals

the methods to solve situational problems and case studies. Formal education sees its purpose in ensuring that the learner acquires the skills and knowledge necessary to succeed and thrive in society without wasting too much time getting his or her own experience and making mistakes.

2. A qualitative characteristic of the educational system for progressive education is its continuity and naturalness, just like the beginning of a speech in a child. According to T. Gary, the child begins to speak by himself because it is inherent in humans' nature. However, we would like to note that such an example is unreliable because if a child has never heard human speech and no one has spoken to him, he will not learn it independently. Formal education sees learning as intellectual work that requires effort, especially when mastering complex information.
3. The methods of progressive education include gamification, visualization, and other interactive methods and techniques used in teaching, so the learner is constantly in the role of Columbus or Magellan making discoveries. Formal education insists on the need to consider all previous knowledge accumulated by humankind, simply recognizing their axiomaticity and memorizing them in their pristine form (examples include the laws of physics, mathematics, nature, the location of countries, historical events of law norms in various historical legal documents, etc.).
4. "The progressive approach aims to develop independent thinking in young people," the development of which seems to be the main task of modern education. Formal education requires teaching children to dogma and then, on its basis, at a certain age and with the help of special methods, begin to "educate independently thinking citizens."
5. As T. Gary notes, "The proponents of the progressive approach assure us that children lend themselves best to individual instruction, at most in a group, while formalists argue that neither is practical, because a class usually has 20–30 students and only one teacher. What will everyone else do if the teacher deals with each child individually?"
6. Regarding the characterization of learner motivation, T. Gary notes that progressive education is marked with the position that learners' intrinsic motivation does arise only when they are interested in the content and ways of doing the task. In turn, formal education, based on the need for effort in studying certain disciplines, recognizes that motivation in individual cases can also be external (e.g., the praise of the teacher, high marks, etc.) and can create conditions for the effective acquisition of knowledge by learners.

T. Gary's research is important for proponents of progressive education, both abroad and in Russia, because by comparing formal and progressive concepts, he proves the need for a comprehensive study of each concept's role in solving the educational problems they focus on. In our opinion, it is necessary for a reasonable approach to modernizing the Russian educational process in higher education.

K. J. Gergen proposes a social constructivist approach to the educational process and substantiates it in his works, arguing that the most important thing in the practice

of education is to interpret the definition of "knowledge," which, in our opinion, is essential especially nowadays, when the transition from the information society to the knowledge society is looming [1; 10]. In his opinion, depending on the interpretation of what "knowledge" is, one should choose one or another educational practice, didactic means, and techniques. K. J. Gergen notes that "beliefs about knowledge fill, justify, and sustain our educational practices. Western culture is marked with a division of knowledge into "cumulative (exogenous)," oriented toward the external world, and "universal (endogenous)," aimed at the development of the reasonable beginning in man." He argues that both directions accept a mind or world in which the existence of the external world (usually, material reality) is contrasted with the existence of the psychological world (cognitive, subjective, and symbolic)."

The cumulative characteristic of knowledge, based on the need to use the technique of "observation" during its acquisition, implies that the assimilation of information and knowledge is possible only "when the internal state of man reflects or correctly represents some existing state of the external world (or serves as a mirror for it). Of particular importance to adherents of exogenous knowledge is the neutrality of such observation, its precise fixation, and the prohibition of emotion and individual personal values in the process of "evenly distributed attention." Thus, the main task of the educational environment becomes the transmission to learners of the knowledge that gives representations of the world. Therefore, the teacher's task is to correctly and accurately convey "incoming information from the outside, necessary to build an accurate representation" to learners.

The universal tradition, while sharing standard features with the cumulative tradition (recognizing the need for neutrality in the comprehension of knowledge and eliminating the "superposition" of the psychological features of the individual), differs from it in that it "places the main emphasis on the power of the individual mind." Hence, the educator must first and foremost consider Gestalt psychology, namely, the individual's innate capacity for intuitive decision-making, creative insight, and logic or conceptual development. Therefore, the teacher must use such methodological techniques and tools that further improve the innate characteristics of the learner's mind.

According to G. B. Kornetov, "the dyad of exogenous and endogenous traditions proposed by C. Gergen allows considering, in the context of correlating transmitting and generative education, the interpretation of the ration of the proportion of the influence of education (and life circumstances) and innate human traits on the formation of personality" (Kornetov 2018). Thus, K. J. Gergen argues that the methodology of teaching academic disciplines and forms of educational practice depend on the education concept chosen by the teacher. Thus, according to K. J. Gergen, both versions of educational traditions must be considered when it is necessary to apply educational methods of both the cumulative and universal traditions depending on the specifics of the subject being taught and the stage of its teaching.

As can be seen from the above analysis, the dyads of educational traditions proposed by American educators and psychologists for use in the learning process are often opposed. All authors, except K. J. Gergen, suggest applying progressive education based on the psychological features of the new generation, building the

educational process on innovative methods, moving away from the simple transfer of knowledge from the teacher to the learner. Also, we would like to note that in the process of learning or choosing the educational model, it is necessary to influence the formation and development of the child's personal and professional competitiveness, in particular:

1. The individual development plan is an obligatory element of the individual educational trajectory of each child. It is formed based on personal preferences and concerns the choice of profile or direction of study, elective disciplines, scientific and creative coteries, sections within the educational organization and outside it, online classes in the Internet environment, etc. Such an individual plan allows the child to properly distribute his or her time and creative resources and determine the total weekly workload. It is necessary to form such a development plan from the first days of training;
2. The use of the methods of logical analysis of the professional activity in the educational process is possible only when the learners have formed a sense of responsibility and the ability to reflect, which is quite unusual for "digital natives";
3. The ability to make a functional map of professional activity seems to be an essential component of the formation of the competence approach because it includes the obligatory labor functions necessary for the future chosen profession. In the era of digital technology and changing "normalness," the learner must be ready to change the professional trajectory based on the knowledge, skills, and abilities already formed.

4 Conclusion

Thus, under conditions of sustainable development of knowledge, information, and technology in the world, the following educational conditions, despite the educational models, are necessary to develop the potential of the learner's personality:

1. Ability and willingness of teachers (the method of facilitator communication) to manage the development of the personal and professional potential of each child (learner) based on individualization of educational trajectories through various didactic techniques and practices (various role games, brainstorming, project activities, individual creative tasks, group discussions, debates, etc.) aimed at enhancing the development of the individual and the study group;
2. Creating a special interaction between the teacher and the learner based on the adoption of a dialogic, facilitator style of educational communication;
3. Helping the learners realize their responsibility for their self-fulfillment and self-actualization in the learning process and outside of it.

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Consumer Cooperation as a Driver of Sustainable Rural Development

Nadezhda A. Ovcharenko, Natalia A. Asanova, Saniyat Yu. Hut, Lydia N. Isachkova, and Elena V. Sidorchukova

Abstract Currently, the socio-economic development of modern society in many aspects is determined by the level of introduction of digital technologies. This process in the domestic economy takes place unevenly in both regions and industries. The issue of digitalization of the economy of rural areas is particularly acute, since the conditions for their functioning currently do not meet the necessary criteria for the level of well-being, infrastructure and other indicators. The digital transition of rural areas will provide a new impetus for their sustainable development, where consumer cooperation can act as a driver, since it is this institutional structure, due to essential characteristics, that can meet the socio-economic needs of the rural population and make rational use of the existing potential of rural areas. Consumer cooperation has been providing for the livelihood of rural residents for about 2 centuries, but at present it has decreased mainly in the competitive environment of rural areas of the regions. Digitalization of the rural economy can serve as a stage in the revival of multisectoral activities of consumer societies. When studying and researching the activities of consumer cooperation organizations, it is necessary to distinguish those groups of territories where consumer cooperation together with the state will be able to realize economic development and social mission. In this regard, it will be possible through digital technologies to rebuild all the niches of the rural population.

Keywords Consumer cooperation · Rural areas · Digital economy · Regional differentiation · Digital transformation of processes

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The original version of this chapter was revised: The author name in reference section "Vershitskaya AV" has been changed to "Vershitskiy AV". The correction to this chapter is available at https://doi.org/10.1007/978-3-030-77000-6_190

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1 Introduction

Consumer cooperation is an original system with about 200 years of history, providing the livelihood of rural residents with goods and services.

Consumer cooperation functions and develops in a multisectoral spector. The current trend of socio-economic development is based on the digitalization of various stages of business and organizational and legal relations.

The digitalization of the rural economy in the context of this study refers to a system of socio-economic relations based on the use of digital information and communication technologies. According to a number of researchers, it is the digitalization of the rural economy that will contribute to the development of transport, energy, engineering and social infrastructure in rural areas. In this regard, it will be possible through digital technologies to rebuild all niches of the rural population (Ashinova et al. 2017; Frolova et al. 2019).

The revival of consumer cooperation is associated with the implementation of the program "Digital Economy of the Russian Federation." Digitalization of the economy of the organization of consumer cooperation is being transformed in an integrated system of functioning of all subjects of rural territories. Consumer cooperation is the center of social directions for the development of rural areas to improve the living conditions and well-being of the population.

2 Methodology

On the basis of monitoring the administrative zoning of the Krasnodar Territory, studies were carried out on the development of the activities of the organization of consumer cooperation with the support and development of state information systems in rural areas.

Digitalization of the socio-economic processes of rural development affects the transformation of the financial and economic multisectoral activities of the organization of consumer cooperation in the rural sector.

Regional development, including rural areas, is extremely uneven and there is a gap in living standards, access to services and information sources, depending on internal and external factors. Digitalization of the economy of rural areas should be carried out comprehensively and a significant place is given to organizations of consumer cooperation (Vasilyeva et al. 2018).

Consumer cooperation performs the most important function for the development of forms of small and medium-sized business in rural areas. Given the current situation in the development of a strategy for the development of consumer cooperation,

it is necessary to highlight as a priority mechanism for interaction between the organization and state-executive authorities, on the implementation of the functions of a socio-economic mission in the countryside (Fig. 1).

The focus of consumer cooperation in rural areas in the context of digitalization of the economy is represented by the possibilities of multisectoral activity, organizational and legal structure, which, in the context of globalization, allows to ensure diversification and rational use of existing potential (Asanova 2019).

The lack of economic benefits from the organization of consumer cooperation, state support is required, and in the context of digitalization, it becomes possible to use innovative tools that stimulate the development of cooperative entrepreneurship in rural areas.

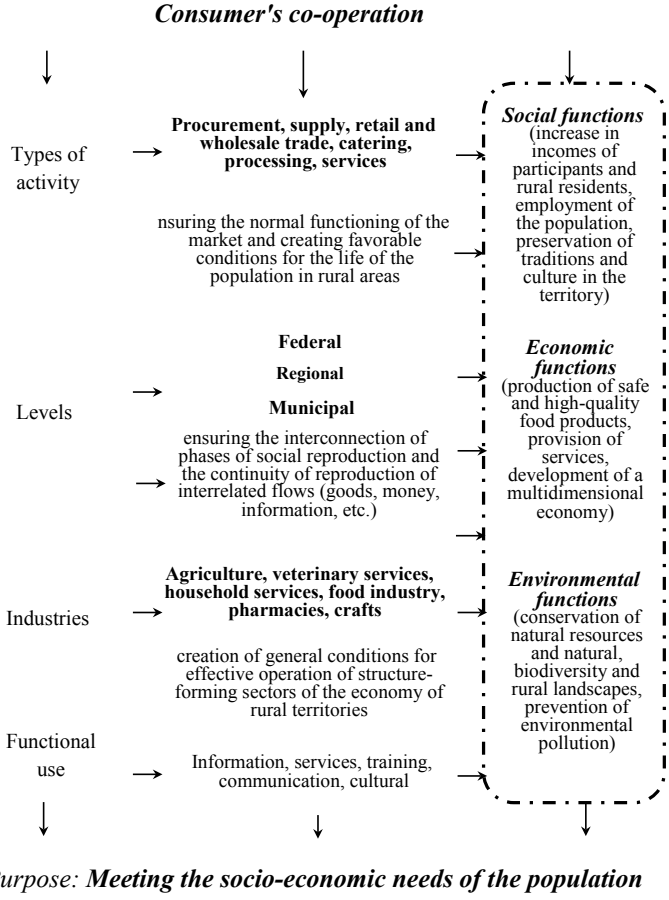

Fig. 1 Target direction of consumer cooperation. *Source* Compiled by the authors

3 Results

The transition to the digital way of rural territories and as an important sector of the organization of consumer cooperation, a differentiated approach to rural territories is required. Research is presented in Fig. 2 on the types of municipalities of the Krasnodar Territory. Studies were carried out on the basis of the grouping of municipalities depending on the population, infrastructure and other indicators, Fig. 2.

Administrative zoning of the Krasnodar Territory was studied and three groups of municipalities with natural-climatic, economic and socio-cultural differences were identified (Isachkova and Isachkov 2016).

The grouping of territories of the region was carried out on the basis of statistical data for 2020, on the presence of administrative territorial units, so in the Krasnodar Territory it was noted: 38 districts; 26 cities (of which 15 regional and 11 district subordinations); 12 inner-city districts (districts) 4 districts, 8 districts; 12 urban-type settlements (14—with Dagomys and Sirius)—settlement districts of 3 settlement districts are endowed with urban status; 399 rural (village) administrative districts (settlements) 377 rural districts, 9 village districts, 13 rural settlements; 1725 rural settlements.

When differentiating the territories of the region to identify a favorable environment for the development of cooperative entrepreneurship, the criteria were: socio-economic development, the presence of city-containing enterprises, unemployment.

Differentiation of the territory of the region

1st type ***Municipal districts with developed infrastructure and transport support, a wide network of consumer market organizations, sufficient personnel potential and a high level of development of sectors of the national economy (agriculture, processing, etc.)***

Novorosssiysk, Krasnodar, Krymsk, Labinsk, Slavyansk in the Kuban, Tuapse, Kropotkin, Armavir, Belorechensk.

2d type ***Municipal areas with insufficient infrastructure and transport, multifunctional rural economy, the average level of socio-economic development conditions, agriculture of the predominantly suburban type***

Krasnoarmeysky, Krylovskaya district, Dinskaya district, Yeisk district, Caucasian district.

3d type ***Municipal areas with low levels of infrastructure and transport, unfavourable socio-economic conditions of rural development, high unemployment***

Shcherbinovsky, Ust-Labinsky, Uspensky, Tenginsky-rural settlement, Suvorov rural settlement

Fig. 2 Differentiation of administrative-territorial units by the level of development of information and welfare of the population of the Krasnodar Territory. *Source* Compiled by the authors

Fig. 3 Main directions of development of rural areas of the third type region. *Source* Compiled by the authors

Author's studies have identified three types of territory of the region, Fig. 3, which makes it possible to determine the most favorable zone for the development of the activities of the organization of consumer cooperation in the digital economy and state support in the implementation of socio-economic programs for the development of rural territories (Zhminko et al. 2015).

In our opinion, an important sector of the revival of consumer cooperation in digital transformation is rural areas of type 3. It should be noted that the third level of rural areas is low, as shown in Fig. 3.

We believe that the active introduction of digitalization in the rural economy will be a new impetus for the sustainable development of rural areas, where consumer cooperation can act as a link (driver), which is due to its competitive advantages (Fig. 4). The main characteristics of the competitive advantages of consumer cooperation, which can be formed through the digitalization of the rural economy: optimization of processes, the search for new directions for improving the level and quality of life of the population, the creation of a personalized and attractive service infrastructure in general, focused on the interaction of the producer and consumer (Ovchinnikova et al. 2014).

The digital transformation of the rural economy should be carried out on a large-scale and systematic basis with the active introduction of cloud technologies, unified information platforms and communications in all spheres of life of the rural population. We believe that the main directions of digital transformation of consumer cooperation in rural areas should include (Fig. 5):

– digitalization of educational and consulting services;
– digitalization of trade activities;
– digitalization of service facilities.

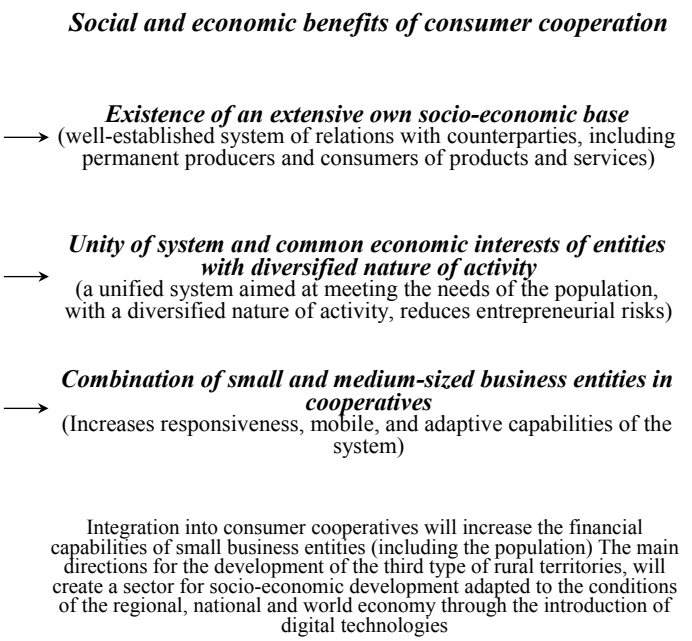

Fig. 4 Main socio-economic advantages of consumer cooperation organizations. *Source* Compiled by the authors

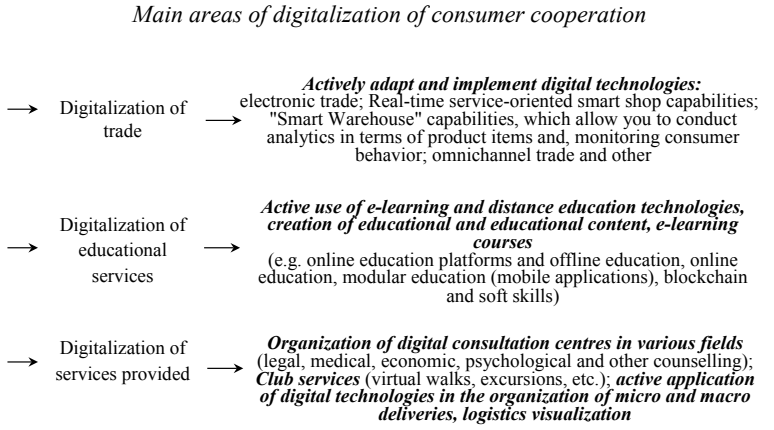

Fig. 5 Main directions of consumer digitalization cooperations. *Source* Compiled by the authors

Educational organizations of consumer cooperation will provide opportunities to train employees of consumer societies, rural residents in the skills of working with digital information, technologies and applications (Kobtseva et al. 2017). For example, the formation of a single Internet portal of consumer cooperation, containing information on the demand and opportunities for marketing agricultural products by small producers, will on the one hand increase the incomes of rural residents, and on the other, reduce the cost of products, since there is no link of intermediaries.

It should be noted the active activity of the Russian University of Cooperation in the implementation of educational programs in offline and online modes. The practical oriented educational activities of the university are aimed at training qualified specialists for the organization of consumer cooperation, including special requirements for the digitalization of economic processes.

4 Conclusion

Trade is the main activity of the organization of consumer cooperation. Digitalization of the economy of rural areas will affect primarily the trade sector. Given the need for information and communication programs, it is essential first and foremost to create an environment for electronic platforms for wholesale and retail trade. Taking into account foreign and domestic experience, Internet trade allows not only to satisfy the needs of the population in a variety of goods, but also to increase the profitability of consumer cooperation organizations, to expand the range of goods in the field of a certain sector of the economy of rural areas (Takhumova et al. 2018).

Comprehensive digitalization of rural areas provides for an increase in the level of infrastructure for the delivery of goods, logistical support and quality of services.

Therefore, the widespread development of cellular communications, the Internet and the active introduction of digital technologies through the formation of cooperative ties between manufacturers and sellers, the digital transformation of all spheres of life of rural residents will contribute to reducing expenses and simplifying product and service promotion chains. Currently, consumer cooperation can become the "engine of development" of the digital transformation of the rural economy, which has a multiplier stimulating effect on the sustainable development of rural areas.

In order to solve the programs of digitalization of the economy of rural areas, many problems are required. The organization of consumer cooperation with goods and services that provide the population is a driver in the overall rural management system (Hut 2015).

An integrated approach in the digitalization of rural areas will create a model for the expedient coordinated use of the opportunity and advantages of organizing consumer cooperation. digitalization will affect all activities of the organization of consumer cooperation in which they are aimed at improving the infrastructure of logistic ties in the economy and the socio-cultural level of rural residents.

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Cooperative Entrepreneurship in Sustainable Rural Development

Natalia A. Asanova, Saniyat Yu. Hut, Fatima R. Yeshugova, Albina E. Zhminko, and Natalia G. Ovchinnikova

Abstract Cooperative entrepreneurship is an important area of the market-oriented economy of rural areas. Overcoming the crisis state of the economy, organizations of consumer cooperation in the segment of small and medium-sized businesses are focused on preserving the accumulated experience and traditions, while developing innovative areas, mastering new technologies that provide for the digitalization of all processes. Consumer cooperation organizations occupy their own niche in the modern market space and ensure the socio-economic processes of rural areas through the procurement of agricultural products, trade, public catering, and domestic services. Studies have shown that the rural territories of our country lag behind not only in the development of the information and communication environment, but also in the level of well-being and quality of life of the population. Prospects of development of multisectoral activity of organizations of consumer cooperation on the basis of stable state-partnership relations in ensuring economic security of entrepreneurial activity in the sector of socio-economic development of rural territories of the state in the context of federal districts are considered. The advantage of cooperative entrepreneurship in the modern competitive environment is the opportunity to participate in forums, exhibitions, fairs for cooperators, which makes it possible to exchange experience, find partners, identify new directions of entrepreneurial activity, reducing the level of threats to economic security.

Keywords Consumer cooperation of Russia · Cooperative entrepreneurship · Multisectoral activity · Rural areas · Digitalization of processes · State-partnership relations · Economic transformation

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1 Introduction

The vector of socio-economic development of the country is predetermined by the implementation of strategic tasks for the nearest period and future. Geopolitical situation, internal problems in management decisions make adjustments to economic policy aimed at ensuring sufficient level of well-being of population and rational use of state territory (Ovchinnikova and Alieva 2004).

The monitoring of the country's socio-economic development indicators shows growth in certain areas of activity and a slowdown in the pace of development in sectors requiring the development of new technologies, achievements in scientific and technological progress, and, accordingly, investment investments in order to overcome the stagnation of the economy and ensure a sustainable level of economic development in rural areas, the share of which is more than two thirds of the entire territory of the state.

To overcome the crisis state of the economy, leading domestic and foreign scientists, analysts in an effective direction to ensure the development of the country determine the intensification of entrepreneurial activities of small and medium-sized businesses in the formation of competition in the market environment of the regions, including involving the development of rural areas. Consumer cooperation organizations belong to the category of small and medium-sized businesses.

2 Methodology

Consumer cooperation in Russia, having centuries-old traditions, in the market-oriented economy of rural areas is an important segment of all forms of business, based on the specific features of the organizational and legal form (Asanova 2019).

Cooperative entrepreneurship in Russia, based on many years of history, confirming that this direction for the recovery of entrepreneurial activity and socio-economic development of vast rural areas is not only promising, but also allows for the comprehensive implementation of solutions to the entire range of tasks of the state's economic policy, including the rational use of the territory.

Consumer cooperation organizations occupy their own niche in the market space and ensure the socio-economic processes of rural areas through the procurement of agricultural production, trade, catering, and services. In recent years, the competitiveness of consumer cooperation organizations has decreased, with the arrival in remote rural areas of large trade organizations "Magnit", "Pyaterochka". At the same time, only organizations of consumer cooperation are drivers on the basis of the order of shareholders unite the interests of the organization, individual entrepreneurs and rural residents, whose needs are of a certain nature. A feature of cooperative entrepreneurship is the possibility in each region of the country, taking into account natural-climatic, geographical, national, religious factors, to form and implement a

policy of rational use of territories, solving not only tasks of an economic nature, but also fulfilling a social mission (Ashinova et al. 2017).

The level of rural development depends on many internal and external factors. Since the main activity is the provision of various services to the rural population, the level of development of consumer cooperation, as an integral part of the social infrastructure of rural areas, significantly depends on the standard of living of rural residents and determines the objective needs of socio-economic development.

The high degree of scientific study of the formulated problem is evidenced by the multiplicity of works published on it, including the work of Vasilyeva et al. (2018).

3 Results

In analysing the socio-economic development of rural areas, it is worth noting the decline in agricultural production and, accordingly, the levels of well-being of residents. Consumer cooperation has traditionally ensured the normal functioning of such areas as education, health care and cultures in rural areas.

Organizations of consumer cooperation traditionally carry out multisectoral activities: agricultural production, trade, procurement, public food, accumulating the interests of state authorities, the business community for the rational use of territories and considering the directions of their development is relevant. Modern trends in the economy are based primarily on innovative technologies that provide for the digitalization of all processes (Kobtseva et al. 2017).

Transforming economic processes based on digitalization requires the development of an information and communication environment in rural areas of the country.

Innovative technologies of public administration, the introduction of intellectual intelligence in the field of education, healthcare, production, services, require the formation of IT technology platforms, including remote areas of the country.

Project activities for the development of cooperative entrepreneurship in the market environment of rural areas should be aimed at investing not only in the development of multisectoral activities, but primarily in the processes of information and communication relations that affect the transformation of the economy.

However, special attention should be given to threats to economic security associated with the use of information processes and the creation of conditions for their prevention and elimination (cyber-attacks, fraud and theft).

The materials of the study of the level of use of territories in rural areas reflect the special situation and place in the market structure of the business environment of the organization of consumer cooperation, as small and medium-sized enterprises.

Unfortunately, over the past period, the state of the rural economy has been marked by a decline in agricultural production, migration of residents to large megacities, low wages, the closure of schools and paramedic stations. The direction of development of consumer cooperation organizations is impossible without interaction with state

authorities on the transformation of the digital economy, aimed at creating a favorable environment, modern infrastructure for residents in rural areas. Traditionally, trade, procurement and catering are the main activities of the consumer cooperation organization (Isachkova and Isachkov 2016; Ovchinnikova and Alieva 2004).

Considering the prospects for the development of these industries by consumer cooperation organizations in the process of digitalization of economic processes, it is necessary to be based on existing resources, experience gained, but without modernization, the introduction of new technologies, the achievement of scientific and technological progress and the creation of comfortable living conditions in rural areas of the population it is not possible to realize strategic objectives of rural development policy.

Small forms of farming (including personal subsidiary farms, private agribusiness and entrepreneurship in the field of fishing) in rural areas traditionally form the foundation for the development of agricultural consumer cooperatives and consumer societies of the Central Union of our country.

Currently, according to official statistics, there are 10.0 million registered personal subsidiary farms in the Russian Federation, including 2.1 million commodity units, 102 thousand farm units, 28 thousand agricultural organizations, as well as 6,293 agricultural consumer cooperatives, of which 2563 are functioning units, or 32.2% (Kobtseva et al. 2017).

Questions remain about the organization of the purchase of agricultural products from the population and small farms as individual entrepreneurs, the conditions for its storage, processing and sale, ensuring the quality and needs of the market segment of the economy. Based on the data presented in the Krasnodar Territory, the procurement activity of the organization of consumer cooperation tends to decrease, which is definitely valuable for the purchase of meat, milk, and the purchase of vegetables and fruits is increasing, which indicates a rational system of harvesting activities of potatoes, fruits and berries.

Cooperative entrepreneurship is assessed as the main mechanism for increasing profitability and ensuring access of agricultural producers to markets for the sale of agricultural products and food aimed at improving the quality of life in rural areas with a view to sustainable development of rural areas.

It should be noted that the increase in the growth rate of consumer cooperation organizations is due to public–private partnership. Since for the period from 2017 to 2019 State support was provided in the form of grants. Funds allocated in the form of a grant, as a rule, were used to form infrastructure support for rural areas, including the reconstruction and modernization of the necessary production facilities, as well as the acquisition of specialized equipment and equipment. Data on the volume of purchases from the population of agricultural products by consumer cooperation organizations in the context of the federal districts of the Russian Federation for 2019 are presented in Table 1.

Consumer cooperatives in the agricultural business represent cooperation not only in finding a market for agricultural products, but also in solving investment problems, updating the material and technical base, and searching for new technologies.

Table 1 Volume of purchases from the population of agricultural products by consumer cooperation organizations in the context of the federal districts of the Russian Federation, 2019

Indicators	Central Union of the Russian Federation	Including Federal Districts of the Russian Federation			
		Northwest	Central	Volga district	Southern
Meat purchases, t	58,612	5,346	9,368	27,540	2,890
In% to 2019	87.2	99.3	89.6	78.3	85.2
Milk purchases	203,547	1,236	2,741	171,513	1,123
In% to 2019	56.3	89.2	74.1	63.2	56.1
Potato purchases	46,589	4,523	7,523	19,523	5,987
In% to 2019	74.1	45.3	75.3	45.3	96.2
Vegetable purchases, t	45,236	5,987	94,563	18,452	6,547
In% to 2019	74,0	76.3	88.9	74.3	86.4
Fruit purchases, t	35,236	4,369	6,987	10,569	2,456
In% to 2019	84.2	127.3	74.2	74.0	93.2
Purchases of wild growing products, t					
– Fruit and berries (translated into fresh)	245.3	8.9	1.25	54.3	0.02
– Cranberries and lingonberries	324.3	236.5	1.7	65.7	–
– Dry mushrooms	4.56	1.22	0.23	1.53	–
– Fresh mushrooms	96.7	15.3	10.2	36.2	5.4
– Wild nuts	47.8	–	18.6	4.56	–

Source Kobtseva et al. (2017)

In examining the level of cooperative entrepreneurship in rural areas, it should be noted that the extent and level of impact on rural development varies between climatic zones.

In the context of digitalization of economic processes, a differentiated approach is required to the development of the organization of consumer cooperation in the system of small and medium-sized businesses. Interesting in the content and depth of the study of the issue is the program (Far Eastern hectare), the implementation of which can be supplemented under the programs for the development of consumer cooperation, as a sector of socio-economic development of rural territories.

Considering the entrepreneurial activities of consumer cooperation, taking into account the peculiarities of their organizational and legal structure, it is necessary to highlight the importance of the level of financial condition. With the transformation of the economy into a digital platform, the risks and threats to the financial condition of the organization increase, under the influence of internal and external factors and as a result, currently developing projects on public partnerships in the cooperative

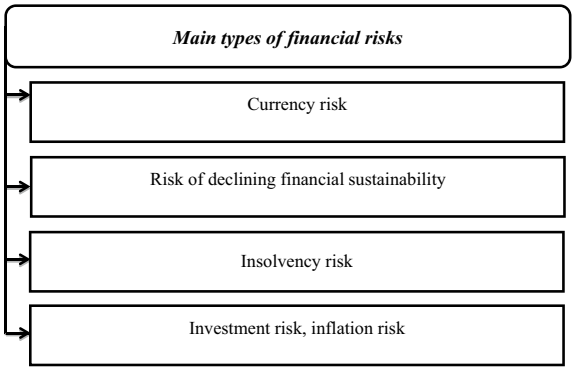

Fig. 1 Characteristics of the main types of financial risks of cooperative entrepreneurship. *Source* Compiled by the authors

environment require the development of economic security events for management decisions.

Ensuring the financial component of the rational use of the territory by the organization of consumer cooperation is considered as a process of preventing damage from negative impacts at all stages, processes, operations of financial and economic activities. An important aspect and component of the rational use of the territory by consumer cooperation organizations in the agricultural business are state-partnership relations for the regulation of entrepreneurial activity (Hut 2015).

The advantage of cooperative entrepreneurship in a competitive environment in a market economy is the opportunity to participate in forums, exhibitions, fairs for cooperators, which makes it possible to exchange experience, find partners, identify new directions of entrepreneurial activity, reducing the level of threats to economic security (Fig. 1).

The study of the impact of the organization of consumer cooperation on sustainable rural development is multidimensional and affects various areas of socio-economic development of the regions. On the one hand, he presents an analysis and assessment of the state of multisectoral activities of the organization of consumer cooperation in the field of functioning of small and medium-sized businesses, and on the other hand, the need to consider the areas of interaction between the state and consumer cooperatives for the development of rural territories.

4 Conclusion

The research also needs to be conducted studying the impact of digitalization on the level of entrepreneurial activity and improving methods of state support for the development of rural areas, ensuring economic security.

The strategy for the implementation of programmes to improve the organization of consumer cooperation in the rational use of rural areas involves the following aspects:

- Sound legal and regulatory frameworks affecting economic processes at all levels, including international;
- Development and implementation of public-cooperative partnership projects for the immediate period and future;
- use of innovative methods of the latest information communication programs;
- provision of benefits, grants, means of financing the organization of consumer cooperation in the development of priority industries for the sustainable development of rural areas.

The entrepreneurial activity of the organization of consumer cooperation in the conditions of digitalization of the economy, through mechanisms of public–private partnership will receive a new development with priority goals of the social line in the revival of rural areas of Russia.

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Conditions and Factors of Development of Agricultural Consumer Cooperatives

Ilhamiya M. Minnehametova, Liliya F. Gafiullina, and Marsel M. Khismatullin

Abstract The article considers the peculiarities of forming and accounting for the creation of a mutual fund in agricultural consumer cooperatives, the types of membership fees that form a mutual fund of the cooperative. The accounting records that reflect the formation and movement of the mutual fund are described in detail. The purpose of the scientific research was to identify the most acceptable conditions and factors for the development of agricultural consumer cooperatives in the Republic of Tatarstan, one of which is the competent formation of a mutual fund. The article proposes the formation of a mutual fund on the principle of economic participation in the activities of the cooperative. The scientific research uses a practical methodology focused on solving practical problems. The subject of the study is the conditions and factors that influence the development of consumer cooperatives, namely, the formation of a mutual fund and the funds raised for targeted financing. Both practical and theoretical methods of research were used: fact collection, observation, analysis, synthesis, induction and deduction. As a result of the research of the formation and preparation of a mutual fund of agricultural cooperatives, some recommendations are justified in theoretical and practical aspects; Criteria have been developed for the effectiveness of cooperative development, such as the involvement of local young people in the activities of the cooperative; improving the financial and economic indicators of the village due to the development of the range of activities; revival and development of local traditions and customs for the production of national products, goods and services; preserving and increasing the natural resources of the village.

Keywords Share contribution · Property share · Share fund · Indivisible fund · Consumer cooperative · Rural territories · Financial support

JEL Codes Q19

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1 Introduction

One of the locomotives of the region's economy is agriculture. An important condition that determines the vector of agricultural development is to increase the business activity of the rural population, support various forms of entrepreneurship in the countryside, thanks to which the life of the local population will develop; there will be an increase in jobs. Today it is important to interest modern youth in the development of rural areas thanks to the creation and functioning of agricultural cooperatives. The youth is our perspective future and if it is interesting to them, the village means will live, and the forgotten cooperation will continue the existence. But creation and functioning are not the only requirements for the development of cooperatives. It is also necessary to be able to work with a mutual fund that has specifics.

2 Materials and Methods

The article considers what features exist in the formation and accounting of the creation of a mutual fund in agricultural consumer cooperatives, the types of membership fees that form the mutual fund of the cooperative. The accounting records that reflect the formation and movement of the mutual fund are described in detail. Acceptable criteria for the effectiveness of cooperation have been identified. Financial support measures for different levels of small and medium-sized businesses were analyzed.

Methods such as fact-finding, observation, analysis, synthesis, induction and deduction were used in the writing process.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as Bank and Suglobov (2014), Gafiulina et al. (2019), Mityushina et al. (2017), Maloletko et al. (2021), Nabiyeva (2021), Shinkareva et al. (2021), Veselovsky et al. (2015, 2016) and Volkov et al. (2018).

The authors also used the materials from Federal Law No. 131-FZ of October 6, 2003 (On General Principles of Organization of Local Self-government in the Russian Federation 2003), Federal Act No. 307 of 30 December 2008 (About Audit Activity 2008), Federal Law No. 131-FZ of October 6, 2003 (On General Principles of Organization of Local Self-government in the Russian Federation 2003), Accounting Policy of the Organization (Accounting Regulations "Accounting Policy of the Organization" 2008), Accounting Regulation "Changes in Estimated Values" (Regulation and "Changes in Estimated Values" 2008), Accounting Regulations (Regulations and (PAS3) 2000), Accounting Regulations "Accounting" (RAS 4/99) of 6 July 1999 (Accounting Regulations "Accounting" (RAS 4/99) 1999) and Chart of Accounts approved by the Ministry of Finance of the Russian Federation No. 94 (Chart of Accounts approved by the Ministry of Finance of the Russian Federation 2000).

3 Results

In the creation of the Agricultural Consumer Cooperative (ACC), physical and legal persons are decided to unite in a cooperative, and it is convenient, efficient and expensive to sell the products they produce. In addition to the title documents, the cooperative must provide itself with important documents—this is a register of members and associate members of the ACC and a membership book.

The Register of Members and Associate Members of ACC is an analytical document reflecting the exhaustive movement of the mutual fund of the agricultural consumer cooperative by members and associate members (shareholders), contains personal information about each shareholder (TIN, the size of the mandatory, additional share contribution of a member of ACC, the amount of incremented shares), and the extract from the register is called another membership book, which reflects the movement of one member In our opinion, the membership book should be kept in duplicate, one copy should be stored in a cooperative with all documents of strict reporting, in order to prevent the loss of information about the member of the cooperative and the movement of mutual contributions.

The financial and material basis for the creation of an agricultural consumer cooperative is a mutual fund, which is formed from the contributions of members of the cooperative and reflects the share of each member in the production and economic activities of the economic entity. In other words, to create a ACC, funds must be mobilized. A mutual contribution in accordance with the current federal legislation on cooperation can be both property, financial (monetary) and other rights that have a monetary valuation. If the property is paid as a share contribution, the property should be valued with the help of an independent evaluator. The Federal Law "On Agricultural Cooperation" defines two types of share contribution of a member of the cooperative: mandatory and additional.

As can be seen from the name, the first contribution is mandatory for all members of the agricultural cooperative created and gives the right to a member of the cooperative to participate in financial and economic activities, to use the services and benefits of the cooperative to certain statutes of the cooperative, to receive the due cooperative payments. According to paragraph 3 of Art. 35 of Federal Law No. 193 "On Agricultural Cooperation" (On Agricultural Cooperation 1995), mandatory share contributions to a consumer cooperative are established in proportion to the estimated participation of a member of the cooperative in its activities. As a rule, the amount of the mandatory share fee created in Russia by agricultural consumer cooperatives is reflected in the Charter, but it should be noted that this obliges them to make appropriate changes to the Charter after each change of the share fund, which provides for registration events. Based on the study of world experience, we propose to provide for the formation of a mutual fund in the Charter on the principle of economic participation in the activities of the cooperative.

A member of a cooperative who has made a mandatory share contribution uses the services of a cooperative, has the right to vote and can be nominated to the governing bodies of the cooperative. If a cooperative member is recruited, the amount of his/her

share participation in the financial and economic activities, he/she needs to contribute an additional amount to the mandatory share contribution.

Members of Spock need to approach the formation of a mutual fund very responsibly, determining what the cooperative first needs in order to implement conveniently, efficiently and profitably.

The determination of the contributions of cooperative members in proportion to their participation in economic activities can be considered as follows. For example, in the cooperative, 7 members of peasant farms and household farms, who have teamed up to collect and sell milk, and they need to buy a milk truck worth 2.8 million rubles (Table 1).

The basis for proportion (the principle of economic participation) is the number of heads of cows in a member of a cooperative (2,800,000: 200 = 14,000 rubles per head). This amount shall be determined at the General Meeting and recorded.

Consider the reflection of the movement of the mutual fund and its distribution to the accounting accounts (Table 2).

Here are the basic journal entries (Table 3).

If a cooperative member leaves in accordance with the current legislation, he is entitled to receive a share contribution in monetary terms. He is paid the cost of his mandatory and additional share fee and an incremented share in the amount, on time and on the conditions provided for by the Charter of the cooperative (Table 4).

Table 1 Formation of mutual fund in proportion to share participation in ACC

ACC participant	Number of cows, heads	Share of economic participation, in %	Volume of investments
Peasant Farm Enterprise—1	35	17.5	490,000
Peasant Farm Enterprise—2	20	10	280,000
Peasant Farm Enterprise—3	15	7.5	210,000
Peasant Farm Enterprise—4	20	10	140,000
Peasant Farm Enterprise—5	25	12.5	350,000
Peasant Farm Enterprise—6	30	15	420,000
Peasant Farm Enterprise—7	28	14	392,000
Peasant Farm Enterprise—8	27	13.5	378,000
Total	200	100	2,800,000

Source Complied by the authors

Table 2 Structure of account 80 "Mutual Investment Fund"

80	Mutual Fund
80.1	Mandatory mutual contributions of cooperative members
80.2	Additional share contributions of cooperative members
80.3	Shares of associate members of the cooperative
80.4	Incremented shares of cooperative members

Source Bank and Suglobov (2014) Chart of Accounts Approved by the Ministry of Finance of the Russian Federation (2000)

Table 3 Accounting records for mutual contributions by cooperative members

Debit 75/1 Credit 80/1	Mandatory Mutual Fund accrued
Debit 75/1 Credit 80/2	Accrual of additional Mutual Fund
Debit 50,51 Credit 75/1	Cash share contributions made
Debit 08,10 Credit 75/1	Mutual contributions made in property form
Debit 84 Credit 76	Part of the profit is aimed at replenishing the incremented shares of cooperative members
Debit 76 Credit 80/4	Amounts allocated to incremented shares are credited to the ACC Mutual Fund
Debit 80/4 Credit 76	The Share Fund has been reduced by the amount of repaid incremented shares
Debit 76 Credit 50,51,10	Amounts of increments paid on redemption

Source Complied by the authors

Table 4 Accounting entries for payment of mutual contributions to a member of a cooperative who has decided to terminate membership

Debit 80/1 Credit 75/1	The amount of mandatory contribution to be repaid is reflected
Debit 80/2 Credit 75/1	The amount of the additional contribution to be paid is reflected
Debit 80/4 Credit 76	Amount of increments to be paid is shown
Debit 75/1 Credit 50,51	Amount of mutual contributions paid
Debit 76 Credit 50,51	Amounts of increments paid

Source Complied by the authors

In a cooperative, an alternative to a mutual fund can be considered the creation of an indivisible fund, which, unlike a mutual fund, is not divided and is not refundable. An indivisible fund is created:

– through mandatory contributions of cooperative members;
– sending part of the profit by the decision of the general meeting;
– through grants received for the development of the material and technical base (Table 5).

Table 5 Accounting of facts of economic life on formation and use of indivisible fund

Debit 51 Credit 76	Membership contributions by cooperative members
Debit 76 Credit 86	Assessment of membership contributions to the indivisible cooperative fund
Debit 84 Credit 86	Direct net profit towards an indivisible fund
Debit 51 Credit 86/2	Government grant amount received
Debit 86/2 Credit 86/1	The amount of the state grant was mobilized for the purchase of property of an indivisible fund

Source Complied by the authors

In the work plan of accounts, 2 sub-accounts are opened for account 86, "Earmarked funding and earmarked income," 86/1, "Indivisible fund - asset acquisition fund," 86/2, "earmarked budget income."

Undoubtedly, at the time of the creation of agricultural consumer cooperatives, there is always a lack of knowledge and financial resources, and in addition to the funds of the mutual fund, the indivisible fund, cooperators are invited to use many tools of the online information portal for small and medium-sized entrepreneurs (agricultural consumer cooperatives, among other things)—Business navigator of small and medium-sized enterprises (SMEs). The main task of the information and analytical portal, to provide information support to small and medium-sized enterprises. Having analyzed the existing base of the Business Navigator, it can be noted that a huge labor-intensive work has been done that provides information support to both beginners and already mature entrepreneurs.

4 Conclusion

The study of the process of formation and accounting of mutual and indivisible funds of agricultural cooperatives in theoretical and practical aspects made it possible to justify the following recommendations:

- When forming a mutual fund, focus on mandatory mutual contributions of cooperative members made on the principle of economic participation in the activities of the cooperative;
- Voluntary additional share contribution is not appropriate in view of established practice. This contribution may be transferred as a loan if provided for in the ACC Charter;
- it is better to direct the received amount of profit of ACC to the creation of funds in order to avoid violation of the norms of the Civil Code of the Russian Federation (Civil Code of the Russian Federation of November 30 1994).

In our view, the effectiveness of cooperation will consist in the following criteria:

1. Involvement of local young people in the activities of the cooperative.

2. Improving the financial and economic indicators of the village due to the development of the spectrum of activities.
3. Revival and development of local traditions and customs for the production of national products, goods and services.
4. Conservation and multiplication of natural resources of the village.

Many young people leave the villages for the cities for the pursuit of an easy beautiful life. And it is very important to return these people under the age of 35 (while they are in the category of "young specialists"). The solution to this problem can be seen in the work of some projects to support small and medium-sized businesses. One of these projects is the development of an Internet portal by the SME Corporation and a support program from the Ministry of Agriculture of the Russian Federation. According to the Deputy Minister of Agriculture and Food of the Republic of Tatarstan Khabipov Rishat Rashitovich (Ministry of Agriculture and Food of the Republic of Tatarstan 2020), thanks to the work of the SME business navigator, production cooperatives have easy access to the sale of the products. According to the general director of the corporation, Alexander Braverman, the portal has all the conditions for the development of start-up entrepreneurs and includes averaged data of more than 5 thousand successful small businesses.

Thus, in addition to involving the young contingent in the activities of the cooperative, the main conditions and factors for the development of agricultural consumer cooperatives are the cooperative mutual fund, mobilized on the basis of the share of economic participation in the activities of the cooperative, and the resources provided by the SME portal—Business Navigator (Navigator on Support Measures for Agricultural Operations 2020). Only by combining existing factors and resources for the development of cooperatives can we find ways to solve the problems of preserving rural areas through the lens of involving modern youth in the cooperative movement. As a result, we will get the socio-economic effect expressed in the involvement of young people in the labor cooperative movement. Since only through investing your own equity can you achieve the value of the result.

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Role of Social and Ethical Marketing in Improving Sustainable Business Development

Alexander A. Voronov, Pavel V. Gorlachev, Elena V. Mirzoeva, Valentina A. Rudenko, and Tatyana S. Popova

Abstract The scientific article is devoted to the consideration of the peculiarities of the social and ethical concept of marketing, which appeared in connection with the need to bring the business into line with the requirements of both modern market economy and the principles of social responsibility to individual consumers and society. The theoretical and methodological basis of the research was the scientific works of Kachanova T. S. Belyaevsky I. K., Pushkareva L. V., Voronov A. A., Kotler F. and other scientists. Most modern enterprises recognize the need to implement tools for social and ethical marketing, increasing awareness and consumer protection. Social and ethical marketing at its core implements the principles of consumer orientation, innovation, increasing the value of goods, awareness of the social mission and social responsibility of the enterprise. Increasingly, enterprises are willing to be guided by marketing ethics, such as consumer and producer freedom, limiting potential damage, meeting basic needs, economic efficiency, innovation, consumer education and awareness, and consumer protection. The novelty of the implemented research consists in studying the existing practice and developing the theory of socially oriented marketing of enterprises, as well as determining the directions for improving its tools for the sustainable development of society and business.

Keywords Corporate social responsibility · Organization image · Business ethics · Sustainable long-term development · Social effect concern for society · Marketing · Business economics

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1 Introduction

It can be said with confidence that the very internal logic of marketing development has led to an awareness of the need and importance of applying a sociological approach in practice: the transition from standard sales to the organization of interaction, where the main thing is the establishment of long-term relations with the consumer, with the community, while the simple conclusion of a sales transaction goes to the second (but not the last) plan.

In 1971, one of the authoritative marketing specialists Philip Kotler drew the attention of marketing theorists and the marketing community to the continuity of solving the commercial problems of companies and gaining market prospects with solving pressing problems of society, and also justified the need to use social marketing for the sustainable development of the company. He proposed to consider the commercial potential of market counterparties through the lens of built partnerships with the public, through meeting not only the economic, but also the social needs of society.

According to F. Kotler, social marketing is the development, implementation and control of programs designed to generate income from social services and include issues of product planning, pricing, communication, distribution and marketing research. In their article, Kotler and Zalman write that many people do not understand what social marketing is and often look at it with suspicion (Kotler and Zaltman 1971). Despite the fact that issues of social relations in the context of market activities have been raised by many before, a shift towards attention to fulfilling the wider social obligations of business to society still occurred in the views of corporate managers in the 1980s, which are often called the era of the formation of "social marketing."

The development of social and ethical marketing has become most noticeable in the modern dynamic world. Today, borders between countries are erased, production is internationalized, and the market is increasingly characterized by freedom of competition. In such conditions, the concept of socio-ethical marketing is gaining quite high popularity and perspective. Although the concept of social and ethical marketing originated relatively recently—in the second half of the twentieth century, today it is one of the six key concepts of marketing developed as the economy develops and develops.

It can be said with confidence that the very internal logic of the development of marketing has led to an awareness of the need and importance of applying a sociological approach in practice: from sales to the organization of interaction, where the establishment of long-term relations with the consumer becomes the main thing, while the simple conclusion of a sale transaction is sidelined.

Social marketing is a much bigger and more important idea than social advertising or even social communication. In carrying out activities related to socially oriented marketing, the company is involved in the company's planning of its products, pricing, communication and distribution. Thus, social marketing is a clear

use of marketing skills to help translate the organization's current social action efforts into more effective programming that generates the desired audience response (Belyaevsky 2017).

2 Methodology

Social and ethical marketing as a system, as a concept of business, as a vector of sustainable development of society has not yet formed properly. Not all firms realized its significance and perspective. Only fragmentary can be observed echoes of the use of tools for socially oriented marketing activities. But gradually it is gaining momentum, replacing traditional views on market interaction.

It is worth noting that business structures begin to implement the principles of CSM (the concept of socio-ethical marketing) as effectively as possible when they embed socially responsible behavior in all their business processes.

Business can be developed only in a developed society, therefore, with the help of CSM, companies try to ensure a long-term existence in a competitive market. By improving the overall economy and the quality of life of the population, organizations provide potential demand for their goods and services in the future. That is why they commit themselves to influencing various spheres of public life.

But corporate social responsibility is not only a strategic tool for sustainable development. In particular, with the development of the Internet, an increase in the level of availability of information and the speed of its dissemination, the likelihood of an increase in business reputation risks increases. CSR allows companies to maximize their capabilities to form and maintain a certain image, which is a potential safety net in the event of incidents. It is worth emphasizing here that CSM is not a practice of public relations management. This is rather a response to the challenges of our time, to the demands of a developing society and economy, their new consumption standards.

The tools that contribute to the realization of the postulates of the concept of socially oriented marketing are the following: socially significant marketing; social investment; environmental marketing, sponsorship, charity events; cash grants; corporate volunteering and others. All of them are based on achieving some socially colored effect, somewhat more than simply meeting the needs of consumers.

The main assumption that leads to the implementation of the concept of socio-ethical marketing is that the company, taking care of the consumer, produces healthy and ecological products that do not harm health and the environment. Making the interests of consumers and society significant in planning their activities is the main postulate of the concept.

Therefore, working in the direction of increasing social responsibility, the company needs to remember and take into account the interests of those for whom all this is done. It should be noted that there is no special methodology for conducting

the concept of socio-ethical marketing. Each company, as part of its marketing strategies, itself determines important parameters for society and consumers that can be achieved through the company's products.

Although social marketing has much in common with other approaches to health program planning, it differs from them in the constant efforts of specialists to strategically integrate all conceptual elements. A field for marketing attempts to influence consumer behavior is to offer or strengthen incentives, or consequences that cause intentional changes.

In fact, the very basis of social life, its existence and character consists in various kinds of exchanges, social communications. In contrast to commercial exchange, in which the consumer receives a product or service for money, in social marketing there is very rarely an immediate clear reward to the target audience for its adoption of new behavior, more often these are long-term "investments."

According to the concept of social and ethical marketing, building marketing interaction, the company should shift the emphasis from the product itself and its production to ethics and social benefits.

Social and ethical marketing, which has a pronounced orientation towards pressing social problems, can be called "civilized" marketing. According to many scientists, the goal of social marketing is to use marketing techniques to influence the target audience in order to change their behavior for the sake of their own interests or the interests of society.

Therefore, the concept of social and ethical marketing was put forward as a response to negative reactions of consumers and the media to the harm of company products to public health and the environment. At that time, there was a decrease in the level of confidence in companies advocating the concept of traditional marketing. The objectives of such firms are focused on meeting the immediate needs of consumers, while ignoring the harm to their products in the long term. However, over time, business began to invest in social responsibility, while social expectations began to materialize and grow.

3 Results

The corporate social responsibility model has four components: economic, legal, ethical and philanthropic responsibility. Economic responsibility is related to the main goal of the business—profit-making. Legal responsibility is the need to comply with existing legislation. The company also makes certain requirements for the company, which is manifested in ethical responsibility. It is optional and based on existing standards of morality, but its non-compliance can lead to reputational risks and affect the investment attractiveness of the company. Philanthropic responsibility is a voluntary desire to support social programs (Voronov 2008).

Following the principles of social and ethical activity helps companies to achieve their strategic goals more effectively.

Experts identify some forms of social responsibility: for the state and purity of the environment; before the employee hired; in front of the consumer. Ethics is a category directly related to responsibility. Today, ethics is a whole scientific direction, and the objects of ethics are morality and aspects of morality. Ethics involves the participation of a person in moral development and in the fact that morality becomes part of modern society. If a person is ethical, he will promote ideas and goals that will serve the good of society, and not bring only personal benefits. Ethics covers a wide range of issues related to the moral behavior of people in any sphere—these are domestic relations, family relations, labor, economic and social spheres.

At each stage of life, the individual has questions, and solving questions affects the well-being and worldview of the individual. Ethics is one of the management categories that is constantly changing, and in its transformations reflects the changes that occur within the production activity. Ethics research is constantly ongoing, and its level of development directly affects the formation and achievement of sustainable development of public relations.

Social and ethical marketing is a procedure for complex interaction of organizations with public institutions, clients, suppliers, intermediaries, authorities. This interaction should be based on the recognition of the leading role of ethics and social responsibility of business in achieving sustainable social prosperity. The social-oriented color of marketing is based on the needs and needs of not only its target audience, but also the market as a whole, taking into account the interests of the development of society, labor collectives and individuals. At the same time, it is necessary to try to build relationships in such a way that the business itself does not suffer commercial failures. It is necessary to achieve a "competent proportion" in this process (Kachanova 2009).

The implementation of the concept of social and ethical marketing is the key to ensuring the sustainable market development of retail networks. The concept of social and ethical marketing is gaining incredible popularity in modern society. The factors that gave rise to it are the following: limited resources, growing problems in the field of environmental safety, gaps in the ethical component of the activities of many market actors.

Market actors, who were the first in the market to use social marketing like the Blue Oceans strategy, begin new ways of interacting with the consumer and have a significant competitive advantage—time, until the features of this enterprise are leveled based on benchmarking. We can confidently say that enterprises that want to stay afloat are forced to adopt the experience of pioneers in the field of building their socially oriented market strategy.

Socially responsible marketing is beneficial for retail chains, because it is a kind of way to justify large profits to society to gain consumer loyalty. Today there is a tendency to care about the state of the environment due to the exacerbation of environmental problems, that is, the basic human needs for clean food, clean environment, etc. are not sufficiently met. Therefore, in the future, enterprises need to adjust marketing policy to the prospective requirements of the consumer, which, first of all, are associated with the implementation of the concept of socially responsible marketing.

In this regard, trade networks are aware of the need to pay special attention to corporate ethics and social responsibility issues, which are aimed at the future, are related to the long-term interests of the development of companies, but also contribute to the achievement of the preservation of the environment and social peace, respect for human rights, safety and well-being of citizens.

Corporate social responsibility tools allow you to work effectively with employees: motivate, retain and develop them. CSM provides WIN–WIN solutions when receiving any requests from the third sector of the economy (non-profit organizations) and helps to build relations with state authorities.

The result of using the concept of socially oriented marketing like image advertising has a long-lasting effect, because the trading network can gain competitive advantages using state support for socially responsible business: external advertising is not paid, hiring workers with physical disabilities reduces the level of taxation, the production of environmentally friendly or safe in the disposal of goods makes it impossible to collect fines or apply other sanctions.

4 Conclusion

In the new economic conditions, the importance of socially responsible marketing increases significantly, because the psychological aspect of the feeling of "involvement in a good cause" among the consumer becomes commercially profitable for the producer. Therefore, the crisis and post-crisis period is characterized by a high level of consumer savings, reduces the efficiency of branding, the popularity of brands and marketing communication policy tools. After all, first of all, the consumer is looking for practical benefits for himself and for his loved ones from making a purchase in retail chains.

The current situation in entrepreneurship is characterized by dissatisfaction with moral and ethical needs and is one of the factors of the economic crisis (lack of confidence in producer–consumer relations, transparency in conducting business processes and a low level of responsibility that cause an imbalance in economic equilibrium). Therefore, during strategic planning, companies need to be guided by the following principles of socio-ethical marketing: strategic responsibility; responsibility for information; social responsibility; responsibility for the implementation of commitments made; responsibility for personnel and contact audiences; responsibility to the environment; responsibility for return on investment.

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Management Capital and It's Role in Sustainable Development

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Abstract The purpose of this research is to theoretically develop the concept of management capital and determine its role in sustainable development in general and when considering sustainable development from various perspectives. The authors distinguish three levels of sustainable development (macro, meso, micro) and analyze the role of management capital in sustainable development at each level. According to the results of the study, it was concluded that from the position of the resource component, management capital includes: at the micro level of sustainable development—the human and relative capital of the organization's management, the organizational and structural capital of the organization (infrastructure, communications, information channels, mechanisms for attracting investments financed at the expense of their own funds, the funds of founders, owners, creditors and other investors who want to invest their capital in the activities of the organization; at the meso-level of sustainable development—human capital, relative capital and organizational and structural capital of the governing body of the region, territory; at the macro level of sustainable development—human capital, relative capital and organizational and structural capital of the country's leadership. The paper presents the author's approach to considering the role of management capital as a set of management resources, relationships, accumulated knowledge, skills, management experience in ensuring sustainable development, which, in turn, can be positioned in different planes of understanding and at different levels of analysis.

Keywords Management capital · Sustainable development · Relative capital · Resources

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1 Introduction

Issues related to solving problems and identifying prospects for sustainable development have remained relevant over the past decades. The current changes in the foreign policy of most countries, the formation of new sources of confrontation in the world economic space, challenges and threats of an environmental nature, the increase in morbidity and the inability of national health systems to protect populations from the recent pervasive viral diseases are all fully relevant to sustainable development as a fundamental paradigm for the development of society, aimed at providing all the necessary resources, not only to the present but also to subsequent generations of humanity. The role of management capital in these processes is decisive, since the quality of decisions made, the validity of the actions of managers at different levels and their professional competence depend on the success of projects, programs, strategies for the sustainable development of any socio-economic systems.

The role of management capital in sustainable development can be viewed from different perspectives and levels. In this article, the analysis was carried out at micro-, meso-, macro-levels.

From the position of sustainable development at the micro level (organization, firm, household), which can be defined as long-term stability or positive dynamics of indicators reflecting the main parameters of functioning (Bakhenskaya 2011), management capital is the basis of long-term well-being, and its carriers participate in the formation of development directions taking into account many external factors and components of the internal environment of the organization (firms, households), both in general and their managers (knowledge, purpose, talent, business flair, professional skills, managerial exclusivity and the ability to bring promising creative ideas to life with maximum benefit).

From a meso-level perspective of sustainable development, which can be defined as "a process of region/territory-positive change, where the exploitation of resources, the direction of investment, the orientation of technological development and social change are in harmony, Increase the value of current and future capacity to meet human needs and aspirations "(Barlybaev and Sitnova 2019) as current, as well as future generations, we understand management capital as a set: (1) principles and methods for the development of management decisions; (2) management resources of territories (knowledge, management experience, management skills, possession of professional information, etc.), the use of which gives the maximum positive effect in terms of achieving the goals of sustainable development of the region/territory.

At the macro level, the sustainable development of the social and economic macro of the system is "managed system-balanced adaptive development that does not destroy the natural environment, ensuring its qualitative renewal and internal integration, sufficient for indefinitely long effective opposition to those phenomena and processes that threaten the security and very existence of the system" (Sitnova 2012). Management capital in this system includes a set of management resources of the

state, focused primarily on the formation of state policy and its implementation mechanisms in the field of sustainable development of the country's economy, its regions and territories.

The problem of sustainable and balanced development of regions and local territories today has become extremely urgent, due to the increasing trend towards globalization, and as a result, asymmetries and unevenness in territorial development, manifested primarily in the form of a deepening socio-economic gap between the center and peripheral regions.

2 Methodology

The article used the fundamental and applied works of domestic and foreign scientists involved in corporate governance and management in general, among them the works of foreign researchers S. Borner, R. Weber, K. Evard, H. Grüter, R. Rutinger. Modern research on the formation of management capital in organizations is represented by works in the field: strategic personnel planning (V. M. Mikheev, A. G. Shrubenko); socio-psychological portrait of the leader (E. M. Babosov, A. A. Truss); human capital (E. G. Gospodarik, M. M. Kovalev); personality psychology (Y. L. Kolominsky, V. A. Yanchuk); cross-cultural management (A. A. Brass).

The reasoning of theoretical provisions and the conclusions obtained was carried out on the basis of the use of general scientific methods (analysis, synthesis, comparison), specific methods (generalization and interpretation of scientific data, analysis of managerial decisions), methods of dialectical logic, statistics and sociology.

3 Results

In order to understand the essence and content of management capital, to assess its role in sustainable development, we turn to the prerequisites for allocating the concept of "management capital" as a separate category, determine its main properties and distinctive features, designate the components, systematize the resources that form management capital, and identify the main areas of investment in management capital.

The conceptual apparatus of research includes such concepts as capital, human capital and management capital. Consider the most common interpretation of these concepts, which allows us to indicate the directions of analytical and theoretical developments.

Capital: "self-growing value in circulation" (Marx 1961); "the total value of the resources used to obtain the added value in the production of a socially useful product" (Http://Wikipedia.org); "a combination of liquid material and/or intangible resources in physical units of measurement, as well as financial assets in monetary terms, which, partially or completely, being launched into economic turnover, will bring

its owner—a physical or legal person, reasonably expected net income" (Revutsky 2015).

Human capital: "set of knacks, the accumulated knowledge, abilities, skills and motivations which are possessed by the person, getting them thanks to the general and vocational education, vocational training, know-how and uses them in work for increase in income at the level of the individual, the enterprise, the region, society" (Barlybaeva et al. 2019).

Management capital: "the knowledge embodied in the manager, practical skills, managerial experience, professional management competencies, motivation system" (Barlybaev and Sitnova 2020). The formation of management capital, like the accumulation of physical or financial capital, requires the diversion of funds from current consumption in order to generate additional income in the future.

In our study, we assume that management capital is very closely related to human capital. At the same time, the theoretical and methodological foundations of the study of human capital began to be developed, compared to management capital, much earlier, and, accordingly, we can already confidently talk about the established theory of human capital. Theoretical and methodological studies of managerial capital are only at the initial stage and their relevance is steadily increasing.

It should be noted that management and human capital have both similar and different components. Similarities include the following: "Both capital are factors of social reproduction; they are part of total capital; they have the ability to accumulate; have the ability to generate income; the result of use can have both monetary and non-monetary valuation "(Lavrov 2008); the price of both types of capital is subject to market fluctuations and may change under the influence of supply and demand; subject to physical and moral wear. And human and managerial capital is intangible in nature; their magnitude and changes are difficult to measure; and human and managerial capital are not subject to material wear, but may be lost due to physical wear on the capital carrier. Both capital cannot be donated or used as collateral, but can be transferred or inherited by followers. At each level the special mechanism of "intergenerational" transfer of the accumulated vital and professional knowledge, abilities, skills, the cultures of activity, thinking and decision-making is formed. These multi-level mechanisms do not act in isolation, but are interconnected and affect each other.

At the same time, human capital, unlike managerial capital, seems to be a more complex and multifaceted phenomenon. Moreover, management capital can be seen as a specific component of human capital, based on and growing out of it. However, management capital, at the same time, is both a consequence and a prerequisite for the development of human capital. For wise and effective governance, a perfect system of government is always aimed at the development and accumulation of human capital, because it is healthy physically, spiritually and psychologically, educated and cultural people who ensure the prosperity of society and local communities.

We will define the main properties and features of management capital and its components.

Properties of the administrative capital: the administrative capital "is formed at the expense of real, material and spiritual inputs; the cost of increasing management

capital is associated with the reduction of free time, that is, the loss of one of the most important human benefits; Indirect methods are used in the valuation of management capital, since it cannot be accurately measured and evaluated; the measure and amount of use is controlled by the subject himself depending on his thinking, motivation, worldview, level of education and culture; the result of the application and use of management capital can have economic, psychological, social effects, and these effects can accumulate; growth of managerial capital contributes to productivity growth and qualitative change of managerial labor "(Ivanov 2010); management capital is realized through labour or other productive activities; the valuation of management capital may be reduced if the person does not engage in management activities, for example, in conditions of unemployment or other reasons—maternity leave, illness, etc.; management capital is subject to physical wear due to aging of the human body or death.

Features of management capital: inseparable from the personality of the manager; formed as a result of time consumption, spiritual forces, material means; requires the cost of compensation for physical, moral and psychological, information wear and tear; requires costs of increment, i.e. costs of health improvement, training and development, provision of additional information (Sitnova 2020).

Components of management capital: labor capital—professional knowledge, skills and abilities of a manager to carry out management activities: "the more difficult managerial work, the higher the requirements for qualifications, skills and experience of an employee; intellectual capital—thinking, logic, mental abilities, general awareness, the ability to find, systematize and use information; creative skills and products of creative activity, inventions, patents, publications (for example, published textbooks), etc., which can serve as a source of income; organizational and entrepreneurial capital—the ability to develop fruitful ideas, including business ideas, entrepreneurship, determination, organizational talent, motivation and energy, possession of commercial secrets; cultural and moral capital—values, moral and moral principles of the leader, cultural and social thesaurus or level of cultural development, tolerance, cultural and personal orientation; social capital—social connections and contacts, civic experience, traditions, history, communicative abilities and skills (Babajanov 2019).

In determining the composition and content of resources for the formation of management capital, T. Stewart's methodology can be used, according to which the resources of the organization's capital can be represented by three components: human, relative, organizational-structural (Stuart 1999). This approach allows you to allocate the following groups of resources for the formation of management capital:

(1) human resources (human capital)—a set of personal characteristics and professional qualities of a leader—include qualities that characterize the head of the organization and which can be used by the organization as the main format of development. This category may include: knowledge as a collection of knowledge directly belonging to the manager; knowledge as an object of intellectual and related rights; knowledge as embodied in patents, industrial designs

and organizational innovations useful models and inventions (innovations) (Kovalev and Gospodarik 2011);

(2) relationship resources (relationship capital)—the system of existing relations and relationships of the head—include the relations that the head of the organization builds with other organizations, partners, higher organizations, clients, intermediaries, creditors, founders, owners, etc. (Kolominsky and Truss 2015);

(3) organizational and structural resources (organizational and structural capital) include organizational structure of management, infrastructure of management activities, communications, information channels, mechanisms of investment attraction and system of investment flows receipt (Babosov and Truss 2015).

(4) The formation of management capital based on the use of the above resource groups is based and carried out at the expense of investment investments of entities, both carriers of management capital, and creating conditions for the implementation of management capital of others, organizations, state and municipal management bodies (Bobylev 2006). At the same time, the subjects of investment are the person himself, the family, the company and the state. Cost decryption is shown in Table 1.

How do the above-mentioned characteristics, features, components and resources of management capital influence sustainable development at the micro, meso- and macro levels? Part of the conclusions set out below is based on the results of sociological studies conducted by us as part of the state task of the Ghana Institute for Strategic Studies of the Republic of Bashkortostan "Sustainable Development of the Bashkir Trans-Urals as a Single Socio-Ecological-Economic System," a scientific project of the Russian Federation and the Government of the Republic of Bashkortostan No. 19-410-020019 "Sociocultural factors of economic development of territories." A number of provisions are formulated on the basis of an analysis of statistics on

Table 1 Management capital investment directions

No.	Investment entities	Investment directions (objects)
1	Person	The cost of the person himself to acquire knowledge, skills, health strengthening, health care
2	Family	Costs of parents and families for the upbringing, education and socialization of children. Costs of formation of social environment, support of social contacts
3	Firm	Costs of firms for vocational training, labor implementation (job provision), professional development, safety and health strengthening of employees
4	State	State expenditure on the production of public goods and the maintenance of social sectors, including education, health, culture, physical culture and sports, social security and social protection, infrastructure and ecology, vocational training and retraining, skills development and retraining, migration, pension, social development of the population, etc.

Source Compiled by the authors

the socio-economic development of organizations, regions and countries. Another component of the information base of the study was the expert assessments of professional analysts and the worldview of leading scientists in the field of management capital and sustainable development.

The characteristics of management capital at different levels of sustainable development are shown in Tables 2, 3 and 4.

The analysis of Tables 2, 3 and 4 provides a number of conclusions:

- The role of management capital at all levels of sustainable development is very important, since it is the quality of management decisions and the professionalism of management that determines the success of the sustainable development of all socio-economic systems; at the micro level, the role of management capital is decisive, management decisions at this level are made individually or by a small group of managers; at higher levels, decisions are taken individually or collectively, taking into account expert assessments;
- The scale of management decisions, decision-making centres, entities and objects of investment in management capital increases as the transition from micro-level to meso- and macro-level of sustainable development;
- The responsibility of managers at different levels differs: at the micro level, the responsibility of the manager is complete, at the meso- and macro level—within the limits of authority;
- The directions of sustainable development in general are characterized by a single format within the framework of the three-unit system "economy-ecology-society" with a general focus on preserving and increasing the resource component of enterprises, regions, territories, country, group of countries, improving (not deteriorating) the state of the environment, maintaining stability in society, improving the level and quality of life of staff/population.

4 Conclusion

Therefore, from the position of the resource component, management capital includes:

At the micro level of sustainable development:

- The human capital of the manager, formed through (1) the investment of the manager himself to obtain managerial knowledge, acquire skills, experience of successful management activities; the preservation and promotion of health, appropriate medical care, the maintenance of a system of proper nutrition and lifestyle, living in environmentally friendly areas of the settlement, the formation of a social environment, socialization; (2) due to the investments of the family and family environment through family investments in the education, socialization of the child, formation of his social environment, support of social contacts; (3) at the expense of the firm's investments by means of the company's financing of vocational training and advanced training; (4) at the expense of the state through the

Table 2 Characteristics of management capital at the micro level of sustainable development

Elements	Content
Structure	Organizations, firms, households
Sustainable development	Long-term stability or positive dynamics of indicators reflecting the main parameters of the functioning of the organization, firm, household
Indicators of sustainable development	Income (revenue, profit, other financial revenues), production volume (in kind and value), trade turnover, cost, profitability, equity, headcount
Management capital	Manager's knowledge, managerial experience, professional management competencies, commitment, talent, business flair, managerial skills, managerial exclusivity and the ability to bring promising ideas to life with maximum benefit
Components	Labour (management experience) Intellectual (totality of knowledge and analytical abilities) Organizational (ability to organize) Entrepreneurial (business ability, vision) Cultural and moral (adherence to morality, ethics), social (ability to establish relations in society)
Resources	Human (leadership) Relationships (established vertical and horizontal links) Organizational and structural (management structure, management decision-making and implementation infrastructure)
Investment directions	
Subjects	Person, family, firm, state
Objects	Education (knowledge, competence) Health (physical, spiritual, mental) Professional development (retraining, advanced training, career development) Creating conditions (job training, incentives, social security, health)
Control center scale/size	Sole leader/small management team
Decision method	Individual/in a small group of managers
Role of management capital	Defining: the effectiveness of the system at the micro level depends to a large extent on the quality of management decisions, the training of the manager
Responsibility	Full: the head, owner, head of household is responsible for the results of the system at the micro level
Directions for sustainable development	The head, owner, head of household is responsible for the results of the system at the micro level

Source Compiled by the authors

Table 3 Characteristics of management capital at the meso-level of sustainable development

Elements	Content
Structure	Territories, regions
Sustainable development	A process of positive changes for the territory or region, in which the exploitation of resources, investment, orientation of technological development and social change are in harmony, increase the value of current and future potential in order to meet various human needs and aspirations
Indicators of sustainable development	Economy: positive dynamics of gross regional product (GRP), gross territorial product (GTP); ecology: not environmental degradation of the region, territories Society—social stability, population growth, positive migration flows, high level and quality of life in the region, in the territory
Management capital	A set of principles and methods for developing management decisions; a set of territorial management resources (knowledge, management experience, management skills, knowledge of professional information, etc.), development projects and institutions, the use of which gives the most positive effect in achieving the goals of sustainable development of the territory
Components	Labor (experience in managing large territorial systems) Intellectual (a set of knowledge and analytical abilities for managing large territorial systems) Organizational (ability to organize activities for the management of large territorial systems) Entrepreneurial (vision of the region/territory) Cultural and moral (adherence to morality, ethics), social (ability to establish relations in society)
Resources	Human (region/territory leadership) Relations (systems of relations "region—center—region," "center of the region—subjects of the region—center of the region," etc.) Organizational and structural (system of regional/territory management bodies, the presence of departments whose competence includes the development and implementation of program measures for the sustainable development of the region/territory)
Investment directions	
Subjects	Regions, territories, state

(continued)

Table 3 (continued)

Elements	Content
Objects	Education (knowledge, competencies, formation of a personnel reserve for the region/territory, training in leading educational organizations specializing in training personnel for the management of the region/territory) Professional development (horizontal and vertical promotion) Creating conditions (job training, incentives, social security, health)
Control center scale/size	Regional/territory authorities
Decision method	Individual based on expert assessments/peer-reviewed
Role of management capital	Important: the design and effective implementation of regional sustainable development policies depends on the quality and professionalism of decision makers
Responsibility	Within authorities
Directions for sustainable development	Economy: long-term stability or positive dynamics of indicators of socio-economic development of the region/territory Ecology: protection of the environment, improvement of the environment of the region, territories Society: social stability, increasing quality and standard of living of the population of the region/territory

Source Compiled by the authors

creation by the state of general living conditions, personal formation and development of members of society: state investments in the production of public goods and the maintenance of social sectors—education, healthcare, culture, physical culture and sports, social security and social protection, infrastructure and ecology, vocational training, migration, social infrastructure;

– The relative capital of the organization, formed in the process of carrying out activities and increased in the process of developing social ties and contacts with other organizations, partners, higher organizations, clients, intermediaries, creditors, founders, owners, etc., financed at the expense of the organization's own funds;
– organizational capital, including infrastructure, communications, information channels, mechanisms for attracting investments, financed by own funds, funds of founders, owners, creditors and other investors who want to invest their capital in the activities of the organization.

At the meso-level of sustainable development:

Table 4 Characteristics of management capital at the macro level of sustainable development

Elements	Content
Structure	Countries, groups of countries
Sustainable development	Managed system-balanced adaptive development that does not destroy the natural environment, ensures its high-quality renewal and internal integration, sufficient for indefinitely long effective opposition to those phenomena and processes that threaten the security and very existence of this system
Indicators of sustainable development	Economy—positive dynamics of gross domestic product (GDP), gross national product (GNP); ecology—not environmental degradation of a country, group of countries; society—social stability, high level and quality of life in the country, countries
Management capital	A set of management resources of the state, focused primarily on the formation of state policy and mechanisms for its implementation in the field of sustainable development of the country's economy, its regions, territories
Components	Labor (experience in managing large territorial systems) Intellectual (a set of knowledge and analytical abilities for managing large territorial systems) Organizational (ability to organize activities for the management of large territorial systems) Entrepreneurial (vision of a country/group of countries) Cultural and moral (adherence to morality, ethics), social (ability to establish relations in society)
Resources	Human (country/group leadership), relations (relations systems "center - region - center," "country - other country (s) - country") Organizational and structural (system of country/group of countries management bodies, presence of agencies responsible for development and implementation of program activities on sustainable development of the country/group of countries)
Investment directions	
Subjects	State
Objects	Education (knowledge, competence, formation of a personnel reserve for the country, training in leading educational organizations specializing in training personnel for the management of the country) Professional development (horizontal and vertical promotion) Creating conditions (job training, incentives, social security, health)

(continued)

Table 4 (continued)

Elements	Content
Control center scale/size	Government of the country
Decision method	Individual based on expert assessments/peer-reviewed
Role of management capital	Important: the design and effective implementation of national sustainable development policies depends on the quality and professionalism of decision makers
Responsibility	Within authority
Directions for sustainable development	Economy: long-term stability or positive dynamics of socio-economic development indicators of a country/group of countries Ecology: environmental protection, environmental improvement of the country/group of countries society: social stability, increasing quality and standard of living of the population of the country/group of countries

Source Compiled by the authors

- the human capital of the region/territory management, formed through the investments of the region/territory, the state to acquire knowledge, develop competencies, form a personnel reserve for the region/territory, training in leading educational organizations specializing in training personnel for the management of the region/territories, professional growth (horizontal and vertical promotion);
- relative capital, including the formation of a system of relations "region—center—region," "center of the region—subjects of the region—center of the region," etc.);
- organizational and structural capital, including the system of regional/territory management bodies, the presence of departments whose competence includes the development and implementation of program measures for the sustainable development of the region/territory.

At the macro level of sustainable development:

- the human capital of the senior staff of the country/group of countries, formed through the investment of the State to acquire knowledge, develop competencies, and create a personnel reserve for the country;
- relative capital, including the formation of a system of relations "center—region—center," "country—other country (s)—country"), etc.;
- organizational and structural capital, including the system of country/group of countries management bodies, the presence of agencies responsible for the development and implementation of program activities for the sustainable development of the country/group of countries.

The improvement of existing productive capacity and spatial economic structure, the creation of an equitable model of inter-territorial economic relations to a large extent lies in the plane of competent management based on management capital, the

formation, use and reproduction of which takes place at three levels (micro-level, meso-level, macro-level). In this sense, management capital is the most important factor not only in the effective functioning of socio-economic systems (enterprises, regions, territories, countries), but also in their balanced and sustainable development in the long term.

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Corporate Social Responsibility of Cooperative Organizations: Accounting and Reporting Tools

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Abstract In today's world, social responsibility is increasingly placed on business as sustainable development ideas and integrated reporting spread. It is based on the need to assess the usefulness for society of the entrepreneurial activities of all the agents involved, especially the largest ones, who have both a negative and positive impact on the environment, the development of the intellectual capabilities of society, the satisfaction of the social needs of certain vulnerable groups of people, as well as all residents under the influence of business entities surrounding them. The international community welcomes the disclosure of such information by organizations. However, there are no uniform criteria for the list of disclosed indicators, their accuracy, methods of its registration and generalization, control. In addition, the problem of managing such activities remains important for management, since a balance must be found between meeting the needs of society and business opportunities. The aim of the study is to identify methods and tools for managing the socially oriented activities of consumer cooperation organizations in order to optimize its cost for organization and usefulness for society. The study is methodically based on the identification of models and tools suitable for this, the analysis and selection of specific methods, the development of a sequence of control over utility and cost in order to control the social activities of consumer cooperation. The results showed that the best solution is to determine a set of different indicators that characterize the monetary and non-monetary achievements of the business in social activities, to

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build on the basis of managerial accounting the registration of costs and achievements, on the basis of budgeting the introduction of a mechanism for analyzing and controlling possible expenditures on such activities with actual ones. This approach to the methodology and set of tools for social information provides governance.

Keywords Corporate social responsibility · Integrated reporting · Sustainable development · Non-financial reporting · Budgeting · Monitoring · Accounting

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1 Introduction

Consumer cooperation in Russia carries out multidisciplinary activities and in certain regions of the country has a 10% share in the entire trade turnover, which makes consumer cooperation organizations socially significant for rural areas. In this regard, the social mission of supporting the rural population through the development of trade infrastructure, the provision of social support to the needy, the creation of jobs and the provision of most of the income of the local budget remains a priority mission of consumer societies.

Organizations of consumer cooperation are characterized by multiple types of activities (trade, catering, food production, the provision of household and ritual services), so there is a need to create an appropriate accounting and control system for the purpose of managing social activities. The multisectoral structure of cooperative organizations, on the one hand, makes it possible to redistribute income between individual industries to meet the expectations of shareholders regarding the profitability of their shares, and the rest of the population, regarding social benefits, on the other hand, imposes responsibility on the management of cooperatives to shareholders for the rational use of their savings. Management is obliged to ensure a balance in which social tasks are carried out within the amount of profit (income) from commercial activities established by shareholders.

These circumstances increase the importance of generating information by type of activity or by industry, as well as by centers of responsibility—to understand the values of profit, income, expenses, including expenses in connection with a social mission, for each branch of a consumer cooperative. Management accounting can become an accounting system for these purposes, and the budgeting of social activities and social reporting built into the management accounting system—the basis for control measures in the framework of managing the social mission of consumer cooperation.

Since the key task of consumer cooperation is the implementation of a social mission based on entrepreneurial activity, the presentation of indicators of consumer cooperatives in terms of fulfilling social tasks is of interest to both the leadership of consumer cooperation organizations and external stakeholders. Such information can be presented in corporate social reporting, any other type of public reporting,

the ideas for the formation of which are proclaimed both in Russian (Concept of Development of Non-financial Reporting 2020) and in international concepts of non-financial reporting (International Integrated Reporting Standard 2020, Akin and Yilmaz 2016) (Concepts for the development of non-financial reporting). The development of non-financial reporting is influenced by the International Standard for Integrated Reporting, which provides accounting and analytical information on effective and productive capital allocation, financial stability and sustainable development from the perspective of three main aspects of the activities of economic entities: economic, environmental and social. A similar approach is found in the sustainable development model.

Full, relevant and appropriate disclosure of the social activities of consumer cooperation organizations is an essential condition for competent management of socially responsible activities. By competent management of socially responsible activities, we mean management, which provides the necessary income for both shareholders and socially oriented activities in costs useful for society, previously planned. Thus, in this way, the main thing for management is to generate profits in the necessary amounts, respectively, planning its distribution between shareholders and society, accounting for social expenses, monitoring and regulation on its basis.

According to Ahmet Akin and İlker Yilmaz (Pavlopoulosa et al. 2019) there is a concept of corporate social responsibility (CSR), according to which business is responsible for the interests of stakeholders and society as a whole. At the same time, there is a relationship between the size of the company, corporate culture, quality and completeness of information disclosure in the most significant areas. Similar studies have been conducted by Athanasios Pavlopoulosa Chris Magnisb George EmmanuelI (Mathuva 2016). The authors found a relationship between the quality of disclosure of integrated reporting and the value of the company. The study by David M. Mathuva (Branco and Rodrıgues 2008) concludes that the disclosure of non-financial information about social responsibility is little influenced by the country's regulatory authorities and the professional accounting community, it all depends on corporate and managerial preferences. Thus, we see that (1) the desire to disclose corporate social responsibility information and the adequacy of disclosure depend on the development of corporate governance (and it is more structured in large companies); (2) regulatory bodies generally do not contribute to the decision to disclose CSR; (3) the more successful the organization, the more it is located to disclose such information (apparently because it has the ability to carry out such spending). A similar study is conducted by M. C. Branco, L. L. Rodrıgues (Dahlsrud 2006).

An interesting study by A. Dahlsrud (Font et al. 2012), as a result of which the scientist analyzed 37 definitions of CSR, concluded that despite many definitions, they all describe five components of business social responsibility. While the definitions are different, they are basically the same, making the absence of a single definition not problematic. It is much more serious that by describing such a new socio-economic phenomenon as the social responsibility of business, no one gives a single approach to how to take CSR into account when developing a business strategy. Agreeing with this conclusion, we believe that management for strategic

and tactical decisions is assisted by management accounting, within the framework of which it is necessary to define profit centers, income, expenses, investments, CSR, a system of budgeting, collection of accounting and reporting information and its control and analysis. This conclusion is confirmed by the study of X. Font, A. Walmsley, S. Cogottı, L. McCombes, N. Häusler (Bowen 1953). It shows that CSR information does not necessarily reflect actual operations, environmental indicators are due to eco-conservation, labor policy is aimed at complying with local legislation. In general, such problems are predicted by R. Bowen and A. B. Carroll (Carroll 1991; Friedman 1970), they have not yet been solved. Friedman Milton (Geva 2008) believed that the idea of CSR is harmful and undermining human community, since the only basis of a free society is for companies to achieve maximum profit. His point of view did not prevail and currently scientists and practitioners are faced with the task of creating an accounting and information system that allows reliable disclosure of information about CSR—this conclusion is consistent with the point of view of A. Geva (Hertz 2017).

2 Methodology

The research hypothesized the possibility of creating a management accounting for CSR using a monetary and non-monetary system of indicators and responsibility centers, including a social mission center. It was established that the implementation of CSR tasks in consumer societies is carried out through the implementation of a social mission. To achieve the tasks of management in the field of CSR, it is necessary to clearly determine the sources of financing of the social mission and distinguish between the income of shareholders and the part of the profit allocated to social responsibility measures. In this regard, it is necessary to use appropriate approaches and responsibility centers in budgeting. To understand the degree of satisfaction of stakeholders and management with socially responsible activities, as well as the correct use of funds aimed at CSR, it is necessary to monitor CSR indicators in terms of completeness and correctness of their formation, their compliance with budget data, as well as utility for society.

3 Results

In multisectoral organizations that perform socially oriented work, have a non-profit status, if there is a profit-generating activity, it is necessary to have detailed information about the results of each activity. Such organizations are consumer societies and their unions. The profit of the organization is considered as one of the sources of financing for CSR. Business risks are considered for CSR management. It is necessary to understand the possibilities of obtaining specified indicators of profitability in comparison with the value of desirable (social needs) expenses for a social

mission, the interest of shareholders, staff and the need to invest in the development of consumer society. It is advisable for the management of social activities to allocate segments on the basis of industry and depending on the role in earning (using) funds for a social mission. This will facilitate the formation of strategic and operational management decisions to increase operating profit and its distribution among these areas of use.

In order to ensure the management of socially oriented activities with detailed information, it is necessary to organize management accounting based on the allocation of segments and centers of responsibility (Fig. 1). Segments must be allocated according to revenue generating activities.

Distinctive features and components of the proposed conceptual model of management accounting of socially oriented multisectoral activities (Fig. 1) are:

– Recording and summarizing in a special way primary CSR information in terms of responsibility centers and segments (accounting component);
– Budgeting of CSR activities by responsibility centres and segments (planning component);
– Reporting on CSR in internal and external social reporting (reporting component);

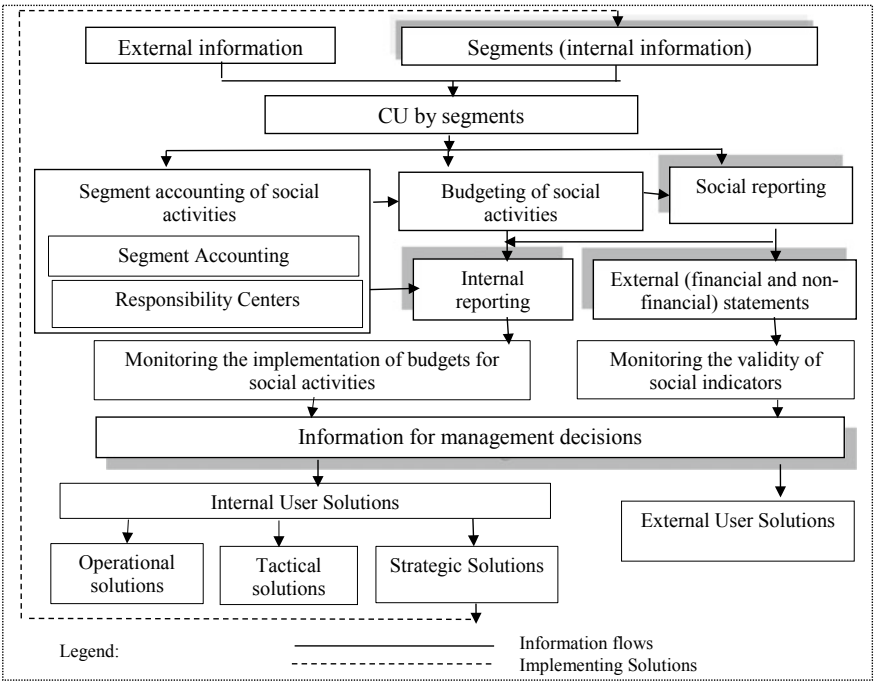

Fig. 1 Conceptual model of CSR management accounting in a multi-sectoral organization. *Source* Kondrashova, O. R. Development of a socially oriented approach in management accounting. Diss. For competition academic title. Candidate of Economic Sciences on special 00.08.12., 2020.—234 p

– Control of CSR information provided to internal and external users (control component).

The accounting component of the specified model (Fig. 1) is based on the original methodology. Its organizational and methodological support is the principle of allocating segments of the organization depending on who the CSR information is intended for: for internal consumers (internal, management segments)—used to form information for management; for external consumers (external, reporting segments)—used to represent information in external reporting. In addition, it is based on the interrelated allocation of segments and classic centers of responsibility within segments. Segments are defined by the activities that generate revenue.

In the composition of management segments, responsibility centers are used in cooperative organizations. It is proposed to establish an additional, non-standard, responsibility center—the center of the social mission, in which costs related directly to the organization of the execution of the social mission should be collected. The social mission center is especially relevant for consumer cooperation companies and similar companies combining commercial activities with non-profit status. Such a responsibility center is also convenient for large holdings, whose socially oriented activities are usually entrusted to special employees or a functional division of the holding.

The planned component of the proposed segment CSR management accounting model is represented by a budgeting system that also requires a special approach. We believe that the budgeting of social indicators should be built into the system of traditional budgets drawn up in the context of segments of activity. The consolidation of planned social indicators for the organization as a whole can be carried out in the budget of the social mission. The study of the main directions of the social mission of consumer societies allows you to organize planning in the context of the following groups of expenses: (1) for the maintenance of employees employed by the CSR (social mission); (2) to ensure the social protection of employees of consumer society, labor protection and internal social programs; (3) to support socially unprotected groups of the population, (mainly shareholders), to charity, propaganda of cooperative affairs; (4) on providing discounts on own products, goods, services to employees, shareholders, pensioners and other categories of socially unprotected citizens; (5) expected losses from the maintenance of planned and unprofitable socially oriented activities (for example, the provision of household services to the population, which must be carried out due to the presence of consumers and the lack of alternative offers).

The last two groups of expenses are imputed costs (or lost profits). They are allocated for the purpose of planning and, accordingly, keeping records of such costs in order to formulate management decisions regarding the harmonization of the size of social activities and the possibility of financing them from targeted sources of the organization, one of which is the cost of preferential prices for goods, works and services significant for CSR. When determining the financial result for the company as a whole, the imputed costs are understandably not taken into account, since they are

counter for individual budgets, are reflected in budgets and reports of interconnected segments and centers of responsibility.

The reporting component is the most debatable moment, since no common approaches have been developed. We propose to separate the presentation of CSR information according to the stakeholders: for external and internal users. CSR reporting should include both monetary and non-monetary items, both financial and non-financial information. The main areas of disclosure of such information are set forth in international documents, but they are so democratic that the choice is more left to the company.

As shown in Fig. 1, the control of the social mission is carried out in two directions: (1) control of the implementation of social activities budgets (the results of control are used by managers to manage socially oriented activities); (2) control of validity of social indicators reflected in external non-financial reporting (control results are used by external users).

The internal control of the social mission execution by each segment is based on the study of financial results by stages of profit formation and by levels of responsibility centers (gross profit, operating profit of responsibility centers, net profit of a consumer company, summarized by segments).

The overall social mission of the organization should be monitored by comparing planned costs and imputed costs in the CSR mode with their actual values, that is, at the budget monitoring level. In addition, the most important control area is the verification of the implementation of the program of social activities and its quality. A separate control procedure is the study of the obtained social effect from socially oriented activities. For all the specified areas, a list of indicators is defined, according to which the planned values are set during budgeting. They are signaling.

Based on the results of control procedures, management decisions are made to plan social activities for any future. Planning is based on the amount of funds that a consumer society can spend on CSR. Naturally, the amount of funds for CSR and their sources depends on the contribution of each segment to the overall profit of the organization. It is important to understand that the basis is not the financial result of the organization, namely, the profit of each segment in comparison with the loss of each particular segment, since the losses of some segments may already be related to social activities, for example, in connection with preferential prices for vulnerable segments of the population. When forming decisions on financing a social mission, the head should still take into account the size of cooperative payments expected by shareholders (the appetite of shareholders) and planned savings of profit (investment appetite).

It is important for external stakeholders to cooperate not only with an economically stable partner, but also with a high level of social responsibility that contributes to the development of society. In the search for the necessary information, external users are interested in high-quality, reliable and complete information on the directions of CSR implementation, which is contained in the public non-financial statements of the organization.

In order to develop reporting that meets the specified requirements of stakeholders and to eliminate possible problems in its compilation and interpretation, it is necessary to develop common standards in the preparation of non-financial reporting. Reporting on sustainable development has been widely developed in European countries, and integrated reporting has been adopted in South Africa. Accordingly, the International Standard for Integrated Reporting (ISIR) (International Integrated Reporting Standard 2020) and the Guide to Sustainable Development Reporting (BRI G4) (Akin and Yilmaz 2016) are used. At the same time, according to Kathleen Hertz, Rupley Darrell, Brown Scott Marshall (Hertz 2017), in 2009 it was decided to bring together integrated reporting (IR), reporting on sustainable development (G4) and the global reporting initiative (BRI), including on the basis of the idea of creating financial and non-financial reporting We agree that combining the two international standards will allow us to develop common requirements for the format and methodology for the formation of public non-financial statements and to link these reports with the financial statements of companies. However, it should not be forgotten that these standards were developed for foreign countries, therefore, in our opinion, do not take into account the Russian features of the legal and economic activities of business, and also does not fully correspond to the conditions in which domestic organizations operate.

The Russian Federation currently lacks uniform rules for the formation of non-financial reporting. The Government of the Russian Federation has prepared a draft Federal Law "On Public Non-Financial Reporting" (Draft Federal Law 2020). By analysing the paper, it could be decided that its developers had adopted the approaches set out in the Guide to Sustainable Development Reporting. The most progressive, but also questionable in the draft Law is the provisions of article 6 "External assessment of public non-financial reporting." According to the draft, non-financial reporting should be independently audited both at the initiative of the reporting organizations themselves and at the initiative of third parties. It is stipulated that the inspection can be carried out in the form of public confirmation or in the form of professional confirmation by an independent person (group of persons). Professional confirmation (certification) of public non-financial statements must be carried out in accordance with audit standards. Such an approach in the current context of the formation and development of non-financial reporting seems redundant. Not because such confirmation is not provided in the international standards of ISIR, the Guidelines of PRI G4, etc. The problem lies in the lack of readiness of the very basis for confirmation: standardization of public non-financial reporting, its status, binding and many other institutional characteristics, including the system of collecting and rules for the synthesis and disclosure of information on CSR in such reporting and its international recognition at the legal level. In addition to these, there is also a lack of standardization of audit of such reports, personnel decisions regarding specialists for such audit.

In the absence of unity with respect to non-financial reporting, including in the area of CSR, it is not possible to standardize the audit, since adequate audit guarantees will not be provided. Without this, it is not possible to trust information on the non-financial activities of organizations in the field of sustainable development. For

example, Maroun (2017) considers integrated reporting from the point of view of ensuring the reliable reflection of information, which is impossible both without standardization of the presentation of such information and audit rules and approaches. Such conclusions can be drawn with respect to any non-financial reporting. Its indicators should be obtained in an understandable way, there should be an understandable system for their verification and uniform requirements for presentation to interested users. Moreover, the indicators of such reporting should be so informative and universal that they can be used to draw a conclusion about the effectiveness of organizations in the field of CSR, the contribution of each company to the development of society, regardless of country, industry, etc. The only solution to these problems lies in the plane of international standardization of non-financial reporting.

4 Conclusion

Despite comprehensive domestic and foreign research in the areas of CSR accounting, management and segment accounting, responsibility centre accounting, sustainable development reporting and integrated reporting, many aspects have not yet been explored. Most importantly, the task of standardizing non-financial reporting and accounting systems for it remains unresolved. The criteria for disclosure are not fully formulated by scientists and policymakers, which does not allow the introduction of unified models of indicators systems in the field of CSR. In our opinion, the prospects and possibilities of organizing accounting, planning, reporting and monitoring the activities of organizations combining commercial and socially oriented activities, in particular, consumer cooperation organizations, have not been studied.

The CSR management accounting model proposed in the article is based on the specifics of the functioning of cooperative organizations in Russia, as well as the features of socially oriented activities of Russian business. The application of this model in the practice of consumer societies allows you to generate the necessary information in management accounting for managing the process of performing a social mission, as well as for disclosing information about CSR in public and internal non-financial reporting.

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Innovative Marketing as a Tool to Improve Sustainable Business Development in a Pandemic

Tatyana S. Popova, Maksim Yu. Dikanov, Anastasia I. Pavliv, Tatyana I. Kozyubra, and Svetlana V. Volgina

Abstract The purpose of this article is to study innovative marketing and its impact on the creation of competitive advantages of companies in times of crisis for the country and the world. An attempt has been made to increase the awareness of market actors about innovation, to consider the prospects and possible successes of innovation activities of enterprises in the field of ensuring their marketing potential. The theoretical and methodological basis of the study was the scientific works of Voronov and Minenko (Innovative technologies for marketing management of a modern trading enterprise. In the collection: innovative economy is the basis for the sustainable development of the state. Collection of articles of the international scientific and practical conference: in 2 parts, pp 24–26, 2018), Diyanova et al. (Research of marketing innovative technologies in the activities of trading enterprises. Krasnodar. No. 44, pp 138–144, 2019), Ladyga et al. (Innovative tools for communication impact on consumer behavior. Econ Entrepreneurship 8:803, 2014) and other scientists. In the current difficult time for the entire community, in addition to the desire to increase profits, there is still something indispensable for the success of the company—this is the ability to think about how to constantly enrich the "consumer experience" of the client, how to take care of him and his new needs. You need to try not only to make the client get the expected value, but also to make him happier. Therefore, it is worth taking care to better understand what people really want and provide them with what they want. The use of various kind of innovative mechanisms and techniques, including marketing is of help in this business.

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Keywords Innovative marketing · Competitive advantage · Sustainable long-term development · Crisis · Creative · Marketing communications

JEL Code M2

1 Introduction

The transformation of ideas about innovative priorities under the influence of the pandemic has become almost the most important topic today. The attitude towards innovation has changed both in businesses, in power, and in public institutions. The pandemic not only became a test of strength for a huge number of industries, but also opened up new opportunities and growth prospects for many.

Self-isolation has changed the structure of marketing communications, modified the principles of creating and consuming content. Social distancing technologies have become particularly widespread: telemedicine services, virtual offices, online educational platforms. In 2020, the world found itself in a new reality that accelerated digital transformation, launched processes of transforming traditional business methods, radically influenced the economy, markets (Voronov and Minenko 2018).

The crisis provoked by the pandemic showed a clear advantage for companies that managed to digitize business processes as much as possible and were able to quickly respond to changes in economic models by launching innovative products. More and more corporations are creating innovative ecosystems to increase competitiveness and using modern marketing technologies to grow their business.

Society, business and world governments are still adapting to new realities, but it is already clear that innovative technologies will remain the main drivers of sustainable growth in a post-covert world. Advanced companies of various sectors of the economy, investors and technologists assess the current crisis as a time of radically new and most promising opportunities in the production, promotion and sale of products.

In normal times, several main problems can be distinguished, including: the problem with ecology and climate; income inequality; extremism; military conflicts. COVID-19 expanded this list, and it added: an increase in unemployment; increasing public debt; high incidence, high number of deaths, lack of vaccine, many people do not follow precautions; increasing poverty. All this forced the business to reconsider the trajectory of its market activity and change the vector of its actions towards the use of innovative marketing tools.

Governments have responded differently. There are 3 main types of COVID-19 policy:

1. Full lockdown (China). Focus on saving lives.
2. No lockdown (Sweden). Focus on saving the economy.
3. Middle path. Hybrid policy: self-isolation for citizens 65+ years; social distance and masking; restriction of mass events; increased medical costs.

If we consider the primary reaction of consumers to new market conditions, then we can distinguish the following highlights. People in panic bought food for long-term storage and hygiene items. Online trading has experienced an incredible rise. Later, the behavior of most consumers and their preferences changed as a whole. Many consumers switched to cheap goods due to falling wages. Consumers buy more in online stores than offline. Whether this trend will remain after the crisis is not yet clear, but, most likely, there will be no full-fledged rollback.

The influence of COVID-19 has spread to business. Weak companies and brands have ceased to exist and will no longer open. About 50% of small businesses will be lost. In some areas, sales during the pandemic fell to 20% of the usual turnover, and somewhere to 0%, as, for example, in the hotel business. Many companies do not know what demand will be in the future and how to plan purchases of raw materials.

Companies responded to the situation by reducing marketing, advertising and communications costs. But, in such a situation, it makes no sense to reduce the cost of marketing activities, it is worth changing only the message to the market and the content of marketing tools. Some advanced companies have reformatted their communication with the market to show more care and attention to customers, taking into account their updated needs and problems. And here, innovative marketing communications tools began to appear and be used more and more often in the market.

2 Methodology

It is always difficult for marketing experts to change consumer behavior. But crisis situations are a kind of incentive, pushing consumers to change their "routine" and their own habits. Below are some tips that may come in handy in this complex, ambiguous, but promising period for innovators:

1. Innovation adoption and adaptation
   Look for new brand innovation opportunities. Business needs to expand its portfolio, eliminate consumer pain points and meet their unresolved needs. Only with the help of new ideas. Difficult times make everyone leave their comfort zones in search of new conditions. Crisis time is the time to plan appropriate brand expansion, launch new or expand existing product portfolios, find new niches, and select modern marketing tools.
2. Increasing Brand Capital
   In the current difficult time, brands can create or vice versa break their fate. Some brands, desperate, resort to discounts and sales incentives to quickly increase sales. However, consumers are locked inside and too insecure about tomorrow to get caught up in these cunning promotions. People do not want to be reminded of things they fear or avoid. Therefore, marketing innovations should be aimed at creating a long-term brand in which brands understand consumers and are their friends.
3. Developing attention

Content marketing associated with Covid and the threat of the virus can be expensive if it is not genuine. Hard moments can easily damage sentiment and turn brand perception into negative. It is important that brands understand consumer fears and concerns and take a position that can help build strong relationships through the use of innovative marketing communications.

4. Increased care
   This is a difficult time for many sectors, and companies have a choice: either fire people, or ask them to go on unpaid leave, or keep their employees, or take care of them and support them. Internal branding should appear not only on paper, but also in marketing campaigns or promotions. This is practiced through the actions and behavior of the leadership at times of crisis. People will not recall companies and brands on marketing actions, but will remember by the small steps they have taken to prove that they "sincerely" care about customers and employees. At such moments, it is critical to select influencers from among employees or customers. We need to let them talk about your new market initiatives and work. Do not be skeptical of temporary silence, it is better to find comfort in it, since it will help brands to strengthen authority and trust in the long run.
5. Finding new ways to tell a story

Sometimes all it takes to make the campaign resonate with the audience is to change the narrative, the marketing message to the market. You can use different platforms to solve consumer problems. As an option—you can start writing blogs, using social networks, trying ads on Facebook, Google, Instagram, Youtube, speaking at conferences and positioning the organization as an expert in some kind of business. All this can be attributed to innovative marketing communications (Ladyga et al. 2014).

The activation of marketing initiatives means that brands must invest more in creativity and innovation. At the same time, marketers can also contribute to breathe fresh life into their companies so that they get out of the creative rut.

2020 seems uncertain, but one thing can be said for sure: everything has passed and it will pass. And when consumers return to a proportionate life, they will leave behind memories of dark days, and remember those brands that did not use all the means in these difficult times to earn more money, but were looking for an opportunity to find a place in the consumer's heart.

Each company should try to build its own strategy with a view to the future. An example is Tesla, whose capitalization at the moment exceeds the capitalization of most classic automotive companies, despite the fact that Tesla production volumes are much lower. This was due to the fact that electric cars are cars that people will drive in the future. A marketer who works for a company that produces cars with internal combustion engines needs to decide whether he will continue to pressure sales professionals to work more actively with customers, or whether he needs to invest in the engineering department and start producing an innovative product (Innovation and Entrepreneurship: Practice and Principles 1985).

Marketing and innovation are two pillars of business development that must be present in any successful company and work together. If only one of them works well for the company, the company will be doomed. Thompson defined innovation as the creation, adoption, and use of new ideas, processes, products, or new services. Linder proposes to consider innovation as the use of new ideas that create the cost of the company and its product.

In more recent research, innovation refers to the creation and use of products, services and new products or the improvement of existing ones, the purpose of which is to increase competitive advantages. That is, innovation is a term that has been used quite often in recent years. But sometimes the interpretation of this category does not correspond to its economic essence. Especially when innovative actions of enterprises are considered to ensure their competitive superiority in the market during the pandemic crisis for the country and for the world.

Marketing, as well as other conditions for the implementation of trade relations, must be adapted to change the technological structure. At the moment, the main motto of the business is "creativity and innovation." The use of innovation depends on the growth, dynamics and even survival of modern organizations. The positive link between the active search for new opportunities or innovative responses and the changing environment of sustainable development is now evident.

In today's competitive market, pressure from competitors has increased. In addition, the market power of customers increases exponentially, who daily face a huge amount of information and no less products of different quality. In this regard, it becomes difficult to attract customers and keep their attention on the market or on the product. In such a situation, companies should have an integrated strategy and innovative marketing methods should be combined with it.

The first step in successful innovation management is to choose an innovation strategy. To develop an effective innovation strategy, the company must understand the requirements and expectations of its employees; know the market in which it operates; Know who the stakeholders are and what their expectations are; Bring together the needs of the market, stakeholders and employees ensure that an innovative vision is shared by all. It cannot be said what an innovative strategy can be considered a reference and taken as an ideal. What kind of innovative strategy the company will use in its activities should be decided by management, assessing organizational capabilities and threats, requirements and needs of the market, customers; employees.

3 Results

Peter Drucker is one of those who was the very first to study the dependence of business success on the effectiveness of marketing innovation. He suggested that innovation be seen not only as a result, but also as a process. According to him, innovation should be systematic and continuous, should affect all areas of the company.

In many sectors of the economy, companies feel the need to develop new products, implement new management methods and organizational forms, explore new markets, all in order to survive. Any enterprise should always identify and consider opportunities for potential innovative ideas.

Before making allocations to the fund for the development and maintenance of innovative marketing activities, it is important to first select the best, most relevant among possible alternatives. Customer requirements are the most important determinant of this choice.

Therefore, innovative marketing includes a very wide range of tasks, all types of activities that are related to customer and market orientation and allow you to successfully promote a new product or service.

You can again agree with the opinion of Peter Drucker in his views on the role of marketing in the business. "The company has only two basic functions—marketing and innovation. It is they who give the result. Everything else is your cost. The purpose of the company is to create customers. The purpose of marketing is the knowledge and understanding of the customer so that the product or service corresponds to it and sells itself." (Farooq 2019).

Drucker said that sales are not a necessity for the company, and you need to intrigue customers enough that they themselves line up. There should be a system of taking orders, but there should not be people who will convince to buy your product. He also said that the best way to understand the future is to create it yourself.

Initially, marketing was reduced to a product orientation, that is, the goal was to develop and improve the product. People didn't think about customers. Later it turned out that you need to understand the psychology of the buyer in order to overtake numerous competitors. After 10–20 years, the concept of branding appeared, and this was a breakthrough. In order to be competitive, it was no longer enough to just present a good product. A brand is an intangible asset of a company, the same as any other that needs to be managed and understood from what it consists, its strengths.

Closer to 2010, we moved into the digital age, and many countries began to focus on social values and the common good. There was a feeling that the company should have a purpose in addition to the main task, which is to produce and sell a high-quality product. Who does the company help? Who does she serve? What is the meaning of its existence?

The key to future marketing success will depend more on smart pricing and strong distribution channels. Creativity and innovation will be essential factors for moving towards empirical marketing. Using virtual reality will help you find new features, visualize a product that is still in development, and thereby understand in advance how future markets will respond to it. Neuromarketing will be used to a greater extent. It is meant to test potential consumers using devices that read the reaction data of their brains when viewing certain images or listening to advertising texts.

4 Conclusion

The pandemic exposed many problems, in particular in the health system, as well as a strong dependence on global supplies of primary products. Recovery rates will vary from industry to industry, and basic industries, of course, will emerge from the crisis much faster. But other industries, such as restaurants, bars, airlines, museums and others, should seriously think about how to conduct business in the future and how to get out of the crisis, with the help of what techniques and methods.

It must be understood that, most likely, this virus is with us for another three years, and it will take much more time to fill jobs to the pre-crisis indicators of profit. On the other hand, there are positive points. For example, the fact that capitalism is under pressure, and it will have to change, become more socially oriented, invest more in medicine and social subsidies.

One day, Philip Kotler said: "If you do what you do in business in 5 years, then you will lose your business." The phrase is still relevant. The business is changing and you need to be able to change with it. And innovative marketing in this is a good assistant.

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Industry Cooperation in the Oil Market as a Factor in the Sustainable Development of the Iraqi Economy

Intisar M. Mohammed and Vladimir M. Pizengolts

Abstract The oil and gas industry is experiencing a third price collapse in 12 years. In the current situation, the shock of supply is combined with an unprecedented drop in demand and a global humanitarian crisis caused by the coronavirus pandemic. In addition, the financial and structural condition of the oil and gas industry is worse than during previous crises. The emergence of shale production, excessive supply of raw materials and generous financial markets, ignoring the discipline of capital restrictions, all contributed to the low profitability of oil and gas enterprises. Today, when prices hit 30-year lows and pressure from society increases, enterprise leaders understand that changes in the organization of risk management are inevitable. In order to change the current paradigm, the industry needs to focus more on using institutional and financial leverage to implement structural change, innovation, and secure financial transactions to ensure the sustainable development of Iraq's economy under the most challenging conditions. The current situation in Iraq's oil market is of particular interest, as it clearly shows that those who can use this crisis to adapt their financial portfolios and transform operational models will benefit. Enterprises that do not do this will not be able to continue operations.

Keywords Oil market · Industry cooperation · Economic crisis · Iraqi economy

JEL Codes L11 · L14 · L71

1 Introduction

The Middle East and Central Asia have faced two major shocks: the first is the coronavirus pandemic, which has a devastating effect on human health, and the second is the drop in oil prices and the emergence of serious economic shocks due

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to supply and demand volatility. Almost all countries reported confirmed cases of coronavirus, and oil prices have fallen by more than 50% since the beginning of 2020, according to the International Monetary Fund.

The corona-virus pandemic has led to the closure of borders between most countries of the world and the suspension of air traffic. Most countries around the world have imposed full or partial curfews and suspended activity in many economic activities (Kingsly and Kouam 2020). All these factors contributed to a decrease in the consumption of oil and petroleum products in the world market, which played a role in reducing oil demand. Therefore, oil sector enterprises are forced to more actively use financial and organizational instruments to counter these threats and increase the sustainability of the development of their country's economy.

2 Methodology

The problems of the development of the world oil market and pricing mechanisms on it are devoted to the works of such scientists as Afanasyev V. Ya., Konoplyanik A. A., Rudneva A. O., Shtrikov A. B. and others. The problems of the development of the Iraqi economy, including the oil and gas industry, are devoted to the works of Azarov A. I., Avarov A. I., Shafranik Yu. K., Shulman D. M., Eifari Abdel Zakhra Kademi, etc. The research used a systematic approach combined with a wide range of other scientific methods: comparative analysis, statistical analysis, classification, retrospective analysis and forecasting.

3 Results

According to the International Energy Agency (IEA), the total decline in demand for oil and petroleum products during 2020 year amounted to about 8.6 million barrels per day, as global oil demand in June reached 86.9 million barrels, which was the lowest in nine years. Market prices began to stabilize and rise only after the easing of quarantine measures and the gradual opening of international borders (Fig. 1).

Since the end of 2019, corona-virus began to negatively affect the demand for energy and crude oil from one of the most important global buyers of crude oil—China (Albulescu 2020). Traditionally, China consumed about 10 million barrels per day. Curfews and the situation in China have led to a significant decline in the transport, tourism and industrial sectors (Zhao and Yang 2020). This situation led to an increase in the level of accumulation of petroleum products and a gradual decrease in the production indicators of oil refineries.

For example, in February 2020, prices for crude oil (ICE Brent) reached $55 per barrel, and the volume of world oil reserves in storage increased by 45 million barrels, which is more than a record level—3332.5 million barrels (OAPEC 2020a). In turn, this led to a noticeable decline in crude oil prices, which negatively affected

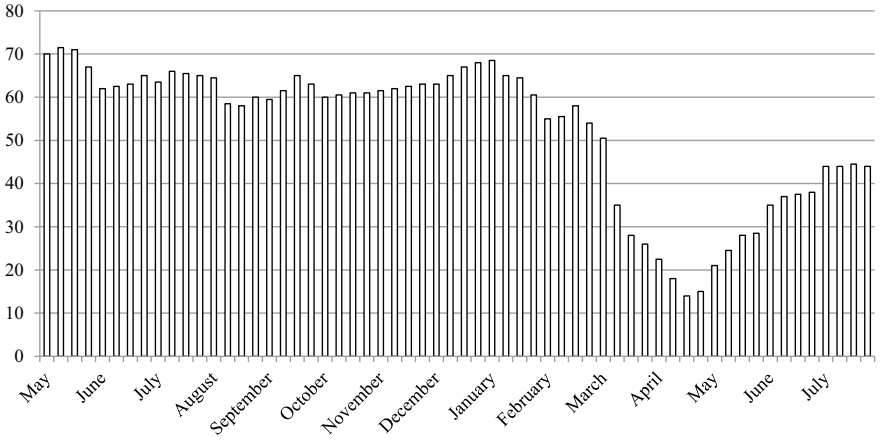

Fig. 1 Brent weekly oil price rate for 2019–2020 ($/barrel). *Source* Compiled by the author on the basis of (OAPEC 2020b)

the financial income of countries producing and exporting crude oil, including Iraq, forcing the countries to hold an emergency meeting in early March 2020.

In order to reduce the negative impact of the market situation on the economies of countries, the Organization of Petroleum Exporting Countries (OPEC) has made efforts to organize cooperation, proposing to reduce production by 3.2 million barrels by the end of 2020. In mid-March, the price of oil fell to $35 per barrel and continued to decline to $23 per barrel. The total decline in the period from February to March 2020 was $28 per barrel, and global oil reserves increased by 87 million additional barrels to a record level of 3420 million barrels during March, and then a record 3460 million barrels. Thus, additional growth amounted to 40 million barrels.

The world economy is still in difficult conditions due to the coronavirus epidemic. Therefore, in order to balance the situation taking into account the coronavirus pandemic, supply in the oil market should be reduced by at least 1.5 million barrels per day. This requires appropriate cooperation among all stakeholders.

In such a way, in March 2020, OPEC + and Russia held an emergency meeting in Vienna, to discuss lower oil prices, reduced production and market rebalancing, to address the impact of falling demand as a result of the pandemic, as well as the need to extend the current agreement between countries, which is valid until the end of March this year, according to this agreement, the countries agreed in December to reduce their production by 1.7 million barrels per day, and the Kingdom of Saudi Arabia pledged to further reduce its quota by about 400 thousand barrels, bringing the total reduction to 2.1 million barrels per day. Unfortunately, not everyone agreed to reduce production by 1.5 million barrels per day, which led to the cancellation of the agreement.

However, the failure to reach an agreement due to disagreements between the countries regarding production reductions and the subsequent outbreak of the oil price war and increase in supply led to an additional significant decrease in prices

in March and early April 2020. The situation reached the point that the price was equal to or less than the cost of producing a barrel of oil in many countries. However, the oil sector has a significant impact on the economies of countries such as Iraq, Kuwait, Saudi Arabia and Russia.

In Iraq, the cost of producing a barrel of oil from $9 to $11, in Saudi Arabia—about $10, while in Russia it exceeds $17, which means that prices of $33 still cover investment and operating costs. Nevertheless, the budgets of the countries include another price for oil, for example, in Russia—$42 per barrel, in Saudi Arabia and other OPEC countries—up to $80. Thus, falling prices harm not only production, but also the sustainable development of the economies of all oil-exporting countries. Crude oil is the most important factor in the overall budget resources of any country in terms of production, exports and financial returns.

An international meeting was held on April 9 and 10, in which 13 OPEC member countries participated, countries producing and exporting crude oil, including IraqX. Other non-OPEC countries also participated in the meeting. Together, they agreed to adjust the oil market and achieve a balance between global demand and crude oil supply, thus ensuring a fair price for both the producer and consumer and investor, and decided to reduce production by 10 million barrels per day in May and June. The efforts made have begun to bear fruit. The price of oil began to change (Table 1).

Table 1 OPEC spot oil prices for 2019–2020 ($/barrel)

Months	2019	2020
January	58.7	65.1
February	63.8	55.3
March	66.4	33.9
April	70.8	17.7
May	70.0	25.2
June	62.9	37.1
July	64.7	43.5
August	59.6	45.2
September	62.4	41.5
October	59.9	40.1
November	62.9	
December	66.5	
First quarter	**63.0**	**51.5**
Second quarter	**67.9**	**26.6**
Third quarter	**62.2**	**43.4**
Fourth quarter	**63.1**	
Average annual	**64.1**	**40.5**

Source Compiled by the author based on materials (OAPEC Monthly Bulletin 2020)

As it can be seen from the table, the price of OPEC crude oil increased in June and July 2020 by 47.2% and 17.3% ($11.9) and ($6.4) per barrel, respectively, compared to previous months, according to the table. However, efforts at sectoral cooperation need to be continued. For example, Iraq played a large role in the negotiations between countries to reduce the production of Saudi Arabia and Russia, when a reduction of up to 11 million barrels per day was made, and thus the volume of production reductions in both Saudi Arabia and Russia, for example, 2.508 million barrels per day, and the reduction of Iraq, UAE and Kuwait 1.061 and 0.722 and 0.641 million barrels per day, respectively, from the above base, and this reduction is equivalent to 22.8%, which is the reduction rate; which applies equally to all, and this level of reduction will be in effect during May and June, and then reduce the percentage share to 18% for the second half of 2020.

It is reported that Mexico objected to a decrease in its production, which led to a delay in unanimous approval of the agreement until Sunday, April 12. Then the United States of America announced its readiness to help Mexico, which will reduce production by 100 thousand barrels per day, as soon as the United States reduces production by 300 thousand barrels per day to complete a reduction of 400 thousand barrels per day during May and June.

The United States and Mexico have broad and diverse interests, including common borders. Also, the US relies heavily on imports of heavy oil from Mexico after Venezuela, due to the imposed sanctions, stopped exporting oil of the same quality, knowing that Mexico is associated with a mechanism for the preliminary sale of part of its oil (Cotler 2020). Thus, it was unanimously decided to reduce production in three stages:

1. In May and June 2020, a decrease of—9.7 million barrels per day.
2. From July to the end of December 2020, a decrease of—7.7 million barrels per day.
3. From January 2021 to the end of April 2022, a decrease of—5.8 million barrels per day.

The coalition of countries led and began positive negotiations between Russia and Saudi Arabia regarding industry cooperation in order to reach an appropriate decision on the level of overall reduction in world oil production over two years, starting from about 15 million barrels per day. The agreement should be unanimous for the countries of the organization and beyond, otherwise, there is no reduction agreement, consensus received an overall reduction of 10 million barrels per day based on documented country production for November 2018, which is the basis of the previous agreement, which was valid for 2019 at the request of Saudi Arabia and Russia, since the basis of their production before the reduction is 11.3 million barrels per day for each, their current declared production capacity exceeds this by one million barrels per day (Oil Marketing Company SOMO 2020).

The Iraqi Oil Minister said after his participation in the OPEC + meeting that the new reality of the oil market and the problems that arose after the epidemic crisis caused global economic stagnation and the accumulation of crude oil reserves due to restrictions on commercial and industrial activities, aviation, as well as the

suspension of plants and. etc., which forced all oil-producing countries to make decisions to reduce oil production in order to cope with the crisis and come out with the least losses, and at the same time find alternatives that would increase state imports (EIA 2020).

According to the above, the producing countries, including Iraq, did not constitute exceptions to the agreed reduction, and this applies to Mexico, which, if the United States of America had not undertaken to make part of the reduction on their behalf, would not have entered into an agreement and the oil market would not have resumed its activities at the request of volumes to be loaded in May (IMF 2020).

4 Conclusion

Due to the efforts made for sectoral cooperation, the situation in the oil market improved in May and June, it is expected that the markets will fully balance by the end of 2020, taking into account the fact that since May production has been reduced to 8.5 million barrels per day in accordance with the OPEC + agreement due to a 19% reduction in production.

In May 2020, the average price of OPEC crude oil increased by 42.5% ($7.5 per barrel) compared to the previous month and reached $25.2 per barrel, with the implementation of an agreement to reduce production between OPEC + countries, in order to counter the emerging coronavirus, global oil demand also began to decline during the second quarter of 2020, reaching $10.4 barrels per day, or 11.3%, compared to the first quarter, reaching about 82 million barrels per day, while in the third quarter of 2020, it began to grow to 92.2 million barrels per day, an increase of 12.5% compared to the previous quarter. Here it should be noted that in the first decade of December 2020, the price of oil increased to $48 per barrel.

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Conceptualization and Interpretation of the Content of the Term "Food Security"

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Abstract The paper focuses on the development of ideas about food security and the content of the term food security at the theoretical and normative-legal levels. Food security is essential for the life of each person and social development. Therefore, the conceptualization of the understanding of the content of this term contributes to the effective solution of theoretical and practical problems in food security in Russia. Food security is considered one of the types of national and economic security, the fundamental theoretical provisions of which have general methodological significance for understanding the essence and meaning of food security. The term "food security" is a broader concept in the general context of security, which assumes the complex nature of the considered social relations. Our analysis gives reasons to distinguish food security from related concepts and consider it a management category with an independent meaning.

Keywords Development · Security · National security · Food security

JEL codes K2 · K3 · K4

1 Introduction

Problems of food security are relevant throughout the world, and Russia is no exception. Food security is especially vital at the level of regional and local requirements to ensure the regulatory provisions of the food sphere. It is generally recognized that *hunger* is a consequence of poverty and low standards of living.

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Food security is implemented on basic principles, including the manifestation of humanism, social and orderly systems, openness, and democracy. At the current development stage, it is necessary to introduce new mechanisms, specific forms, and effective methods of realization of food security, which are created to help the population. In implementing this task, assistance and support to the vulnerable population are of paramount importance.

The food sector allows creating favorable conditions for human life so that everyone can meet their needs for food, which is why it is one of the central and integral elements of social development.

The provision of food and nutrition, to some extent, allowed the world community to achieve economic and business compliance, competition, and the expansion of entrepreneurship. Freedom of trade allowed for the introduction of modern types of food and a variety of goods. Often, the quality and prices of consumer goods are more favorable to consumers. However, we believe this factor depends on the manufacturers themselves.

Goods must be safe for people and the environment and meet the stated standards, demands, and expectations of consumers.

The preservation and growth of the population are a priority for the country. Thus, quality nutrition is closely linked to such global concepts as the quality of life and the nation's health.

In recent years, Russia has carried out comprehensive work to study the safety of raw materials used in food production. Nanotechnology used in industry is also being studied. They help improve the quality and safety of products (e.g., the production of innovative packaging that better protects foods from drying out and spoiling). Nanotechnology can be used to enrich food and beverages with flavonoids and other beneficial substances.

The development of international trade takes place in restrictions. After a considerable decline, there is a positive trend in the trade sector, strengthening of the national currency, and the incomes of the population. Moreover, a certain constancy is observed in the prices for specific categories of products. As a result, the retail turnover also sees a positive trend. Similar to the previous years, ensuring food security of the Russian Federation is carried out according to the provisions of the "National Security Strategy of the Russian Federation until 2020" and the "Doctrine of Food Security of the Russian Federation." The main goals and objectives of trade development are presented in the "Strategy of trade development in the Russian Federation for 2015–2016 and the period up to 2020," approved by order of the Ministry of Industry and Trade of the Russian Federation on December 25, 2014 No. 2733.

The issues of food security arise from objective reasons and factors that largely depend on agricultural producers and low competitiveness in the country, which finds its reflection in the economy. However, the Russian Federation is at the level of the average food security according to many indicators. Evidently, this situation is caused by the problems observed in economic activity, including the lack of material and technical resources and technologies, as well as the lack of effective indicators and requirements.

Currently, of particular interest is a diverse range of organizations and bodies aiming to expand the food market scope and the segment of consumer goods for the population. The work to further increase the market of goods and food is also of some interest.

A growing number of people support the assertion that it is necessary to improve food security by increasing Russian agricultural production, producing raw materials, and expanding the food market. On the legislative level, the solution to this problem and its effectiveness is fully determined by the existing regulations and requirements used by the FAO, WHO, and other international organizations to set standards for the production and processing of products within economic values.

2 Materials and Methods

To outline and explain the conceptualization and interpretation of the term "food security," the authors reviewed information from published official data and sources. Let us give some indicators. Thus, in the Chuvash Republic, there are more than 6.0 thousand retail facilities, including more than 1.1 thousand catering facilities.

However, the introduction of restrictive measures significantly impacted the indicators of the consumer market in 2020. The volume of retail turnover decreased by 8.5% compared to 2019 and amounted to 162.8 billion rubles. The retail turnover per capita equaled 133.7 thousand rubles, which is 0.8% less than in the last year (134.8 thousand rubles). In 2020, catering turnover was 8,369.1 million rubles, which, in comparable prices, is 24.5% less than in 2019. During the year 2020, there were facts of increased (rush) demand and the unavailability of certain goods. Nevertheless, the daily needs and demand of the population for food were fully met. The number of sites for food fairs was 105 units; they held more than 4.5 thousand food fairs, including 600 agricultural fairs. During the food fairs, special trading platforms provided the opportunity to sell agricultural products through special trading equipment. Considerable explanatory work was carried out on support measures for business entities in the areas of trade and services affected by the introduction of restrictive measures.

It is necessary to develop proposals to improve the work of food security in all countries.

When addressing food problems, the main objectives are as follows:

- To ensure the implementation of domestic legislation;
- To ensure compliance with international acts and agreements on export and import of goods;
- To develop and promote all forms of farming, including agriculture and agro-industrial complex;
- To allocate land plots and agricultural land;
- To develop local markets;
- To ensure the quality and safety of products;

- To improve service culture in trade facilities.

The comprehensive method allowed us to assess the existing problem in terms of social processes of provision and solution of the food problem and reveal the main features and data as mutual elements of the complex sectoral food security.

General scientific and applied methods revealed food security as a world problem, which affects all countries worldwide, especially countries and continents that need to support food supply, especially food and goods needed daily.

System analysis, including methods of comparison and analysis, indicates ways to improve the efficiency of agro-industrial production, which is consistent with the world and domestic system of solving the food problem (Prokhozhev 2005).

The approaches are based on existing data in subject science, the concept of economic theory, current norms, and developed provisions on food issues contained in secondary literature related to the topic of food and agriculture.

Currently, the solution to food security issues is built exclusively at the state level. Nevertheless, the issues of a systemic solution to the problem at the international level in terms of coordination of many countries are still insufficiently elaborated.

The applied research methods allowed us to comprehensively study the conceptualization and interpretation of the content of the term "food security." The research revealed the features of food security and established that security is directly dependent on a stable economy and sustainable factors; in particular, the food sphere depends on the weather, climate, land quality, bioresources, etc. (Gorodnova 2012).

The general principles of solving the food problem should be determined by the state program of support for the national economy. The program should enshrine the state's strategic plans for the development and effective solution of security.

State authorities and local governments create conditions for the development of trade, production of goods, and entrepreneurship. This is necessary to maintain economic solvency and competition in the market. The coordination of the necessary measures allows solving various food security problems, for example, to create a large amount of food or save and create the world's food reserves.

We must note that the importance of food security for the population increased in the twentieth century. The importance of food security has become even more pronounced in the twenty-first century, since the society achieved a new level of development marked with an increased role of the government in the processes of equalizing the income of the population, as well as in accepting and providing measures to improve the quality of life at all levels (from the international to the regional ones). To ensure stability, the state has established specific support measures (including the necessary sets of food supplies) for some vulnerable social groups.

Nowadays, almost every country is interested in producing goods and expanding economic entities, since it increases competition, creates a more comfortable environment for consumers, and expands the exchange of goods between countries and continents.

We believe that new technologies of providing food security should improve and solve the discussed issues in the interests of the Russian food market at regional and national levels.

The research extensively uses the general concept of modern science and the results of practical experience, statistical data, and observations of experts.

The main aspect of the research is related to the conceptual views on food security on a global scale. Thus, we should indicate that any society can have risks to which almost everyone is exposed. These risks are related to the deterioration of material conditions, lack of jobs, food shortage, etc. Simultaneously, the state and society have an extensive system of measures to minimize or eliminate such risks, but the growth of insecurity increases, which is typical for countries in Asia and Africa.

The conclusions formulated from a practical point of view provide a holistic view on food security and its main aspects. The above provisions are considered in the analysis of the content of the term "food security" in its various meanings, especially in scientific research, and significantly complement doctrinal approaches.

3 Results

The existing theoretical positions and the results of scientific research show the importance and significance of conceptualization and interpretation of the content of food security. They emphasize the importance of food policy and program on a wide range of issues: overall governance and planning, socio-economic equity, the rational organization of food production and ecosystems, and food supply and distribution.

Rather relevant are the principles of the "Declaration on World Food Security," which enshrines the following conditions (Pshenichnikov and Ruban 2011):

1. Physical accessibility to sufficient, safe, and nutritious food;
2. Economic access to food of sufficient volume and quality for all social groups of the population;
3. Autonomy and economic independence of the national food system (food independence);
4. Reliability, i.e., the ability of the national food system to minimize the impact of seasonal, weather, and other fluctuations on the food supply of all regions in the country;
5. Sustainability, meaning that the national food system is developing in an expanded reproduction mode.

In many ways, food security is solved by the multiple production of demanded or essential goods and expanding domestic production, exports, and imports.

The issues of food security are an economical category rather than a political one. However, the government is interested in resolving these issues and forms the principle of solving national problems and preserving the national economy. In the context of globalization, the interaction of countries on socio-economic issues within the WTO, which inevitably leads to increased international trade and imports of products, is increasing.

We can agree with the statement that food, along with the increase in world population and inability to provide food, is a decisive factor in the context of increasing

global poverty. The UN predicts that the population will exceed 9.3 billion by 2050 (Presidential Executive Office 2020; Sergeeva et al. 2019).

"The food development is subject to parameterization by quantitative and qualitative indicators. Only when these indicators reach their thresholds, there appears a problem of security and the need for a special type of management activity—food security activities. The content of these activities includes risk and threat management, correction of wrong decisions, which are not food security activities in the literal sense of the word" (Gumerov 2018; Sidorenko and Mikhailushkin 2019).

We agree that food security affects the vital interests of society and the country. Nevertheless, the food sphere has standards set not lower than the critical indicators and indicators established by the current legislation. For example, it is crucial to ensure the quality and safety of sold products and provided services or to improve service culture in retail facilities (Gridin 2009; Latypova et al. 2019).

Why do many countries single out food security as one of the main problems?

We can confidently say that this problem cannot be solved only at an internal level of the country. It is essential to provide cooperation at the international level, and, above all, at the level of the UN and international organizations, which assume the economic obligation to provide countries with food and products necessary to ensure the lives of people and create social stability.

Most of the current problems are based on the lack of food supply. Nowadays, many prefer to solve these problems using innovative technologies that are in no way related to natural or climatic conditions, which can increase productivity, develop agribusiness, or create food markets with a wide segment (Alexandrova et al. 2020; Vorobyova et al. 2020).

In light of the above, we can note that the problem of food security is solved only through concerted action between countries and international policy (Zelenkov 2013).

It should also be noted that the food agenda is aimed at sustainable development, strengthening the food base, and improving the quality of nutrition in all countries.

The concept of food security is sustainable and functional. Currently, food is provided by trade markets, the introduction of effective measures to support commodity producers, and the state provision of economically advantageous production conditions (e.g. the reduction of tax payments and duties). This requires ensuring the availability of goods in the necessary volume and quantity from producers, maintaining and increasing stocks of the most demanded goods, and providing support measures for goods suppliers.

According to the Ministry of Economic Development, the Chuvash Republic had a stable food market in 2020. The increased (rush) demand and unavailability of certain types of products were observed in early April, but the demand has recovered since mid-April. The daily needs and demands of the population for food products are met in full.

It must be recognized that food security is an extensive system, which has significant functionality, various tasks, and characteristic features related to the social needs of society and the population.

4 Discussion

In this research, the authors attempted to trace the evolution of approaches, conceptualize ideas about the content of the term "food security," and formulate their own definition for this phenomenon. The social importance of the problem implies a growing scientific interest in the theory of food security, the formation and development of its conceptual and categorical apparatus, and the determination of its place in the system of national security. This requires new discussions and broad debates.

5 Conclusion

The government policy aims to manage the welfare of the population, which keeps it at a stable level suitable for individuals and society as a whole. In particular, production growth was predicted to outpace population growth.

Increasing responsibility in the food market requires the provision of material living conditions. Also, the current policy must help create the basis for the development of the resource potential of groups and communities and ensure their self-promotion and self-development.

Conceptual understanding and disclosure of the content of food security allows us to successfully develop the theory of food security and accurately distinguish the practical activities of the government in the food sphere:

- To monitor the state of society and the state of the food sphere;
- To evaluate the productivity of farmland;
- To make the necessary adjustments to the current management activities of the subjects of development of the food sphere;
- To preserve quantitative and qualitative indicators of food products.

The main task of food security is to provide adequate support and assistance to all segments of the population who need it. The support is provided through approved programs of financial, social, and organizational measures, as well as financial instruments, including the development of oriented systems necessary to increase productivity.

Successful solutions to the practical problems of food security contribute to the well-being and sustainable development of the entire world community.

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Structural Changes in the Food Market and Improved Industry Support Policies

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Abstract The relevance of the topic is due to the fact that the market for agricultural products and the food industry is changing structurally and in order to organize its effective support, it is necessary to deepen knowledge of the laws of its evolution. Based on this, the article is aimed at identifying the features of the evolution of this market in the context of globalization and using the knowledge gained in the policy of regulation and support of the industry. Methods of structural market analysis, product life cycle analysis, growth vector analysis, PEST analysis have been applied. As a result of the study, it was found that in a number of segments of the market studied, the signs of atomism disappeared, the degree of concentration of firms increases. Abroad and in the Russian economy, a search is underway for new approaches to regulating support. In the domestic economy, it is necessary to take a segmental approach to regulating and supporting the industry, paying special attention to small and medium-sized farms and the segment of high-quality food. In this area, using the experience of foreign countries, it is advisable to fully support the organization of production cooperatives, which have the opportunity to become large players in the food market. The results of the research can be used in the development and implementation of a strategy for the development of the agricultural sector and the food industry.

Keywords Agro-food market · Market structure · Evolution patterns · Competitive environment · Market regulation · Industry support

JEL Codes F13 · L11 · L15 · L16 · L6 · Q13 · Q18

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1 Introduction

The topic is relevant, since it is necessary to know more about the patterns of evolution of the agro-industrial market. The structure of the market is changing. There is a transition from the atomistic to the structure of several dominant companies. New market segments, high-quality dairy, meat and other products are being formed. There is a change in market regulation and producer support. Their focus depends on the evolution of the global market.

In the Russian economy, there is an increase in the concentration of firms in the industry market. The share, and therefore the market power of large companies is increasing. Competition conditions for medium and small farms are deteriorating. Having lost the profitability of production, many manufacturers are going to decommodify products. Product quality is deteriorating. Under these conditions, in order to solve the problem, knowledge of the regularities of the functioning of this market should be deepened.

The purpose of the research is to identify the features of the functioning of this market and to develop ways to regulate the market and support manufacturers.

2 Materials and Methods

The analysis of the structure of the food market by segments has determined the prerequisites and consequences of the changes and features of the evolution of the market under consideration at present (Grant 2008). The analysis of the external environment, carried out according to the PEST format, made it possible to understand in greater depth the impact of political, economic, social, technological factors on the evolution of the industry (Fleischer and Bensussan 2005). The analysis of growth factors showed and made it possible to justify the feasibility of entering the market segments of high-quality food to small and medium-sized agribusiness of the Russian regions (Tumalanov and Urusova 2019). SWOT analysis has identified and assessed existing and future opportunities and threats to manufacturers and consumers of products (Tumalanov et al. 2019a).

The authors used the materials from Top 10 largest agricultural cooperatives in the world (Top 10 largest agricultural cooperatives in the world 2020) in this study.

3 Results

1. **Features of the industry market and foreign experience**. Demand and supply in the market, as A. Marshall noted, “two scissor blades” are equivalent in pricing (Marshall 1984). For a better understanding, it is necessary to find out the changes that are taking place on the part of supply and demand.

There are industries where the market power of buyers and manufacturers balances each other. "The balancing power noted by J.C. Galbraith (Gelbraith 1979) may facilitate equivalent exchange by making comparable conditions of competition.

The state usually helps the class of farmers from bankruptcy and ruin. Subsidies, programs to increase purchase prices, reduce sown areas with compensation to farmers for unseeded areas are applied. Therefore, the supply of products is reduced and purchase prices are increased.

However, since the second half of the twentieth century. large companies have formed in the United States and some other countries that have powerful power in pricing. The state in the policy of support gave preference to large associations.

They receive almost the entire amount of subsidies, and small farms of farmers receive only 5% of their total amount (Tumalanov 2004).

The law, adopted in 2018, provides for the allocation of 400 million rubles to support the industry (including forestry). debt for the next 5 years, and for 10 years—$867 billion. On average, $80 billion is allocated annually to support and develop the agricultural sector. We have to move to a policy of direct assistance through subsidies.

The 2018 law aims to involve new people in farm production. It is designed to alleviate economic and social problems and increase employment and income.

2. **Trends in the development of the Russian agro-industrial sector**. In the domestic economy, the change in the structure of the market is going in the same direction. We can also speak about the support of the industry by the state. Demand for food is growing, with rising consumer incomes.

At the same time, their demand for food quality will increase.

In the agricultural and food industries of Russia, there is a smooth transition from an atomistic market to a market with a high concentration of firms.

For example, the total share of the six largest companies in the production of pork is growing. And this contributes to the development of the industry. Large companies use and increase economies of scale. Due to the scale and effect of experience, they are able to significantly reduce the cost per unit of production, especially when the experience curve is successfully combined with the stage of the product life cycle. This phenomenon acts powerfully at the stage of growth. At the maturity stage, firms are looking for new market segments and product differentiation. Often, they resort to strategies to transform marketing activities (Journal "Agroinvester" 2020).

However, in the food market, the use of the product life cycle phenomenon is significantly limited due to the fact that the cyclicity in this industry is very blurred. It can be considered that most of its products are constantly at the stage of maturity. Therefore, manufacturers more often use techniques, characteristic strategies of this phase: actively looking for new product segments, changing the marketing program, trying to find profitable product differentiation options, diversifying. Large agricultural corporations are developing and becoming dominant.

3. **Trends in the evolution of the global agricultural and related industries market**. Along with purely food markets, large corporations penetrate the

markets for seeds, mineral fertilizers, grain processing, oilseeds, potatoes, transportation and distribution of food, and even transportation vehicles. At the same time, the forms of organization of these companies can be various: from cooperatives to holdings of horizontal and vertical integration.

A number of other companies are diversifying towards high technology. This is observed in the world market of seeds, biotechnologies in crop production and animal husbandry, soybean production and processing, sunflower and its processing, feed, corn, plant protection products, etc.

In general, the trend in the market for agricultural and food products and related segments is such that the share of large companies increases both in terms of CR-4 and CR-6. Small firms remain in the industry, but their share is declining. Mergers and acquisitions are taking place, which especially affects the structure of the market and the conditions of competition. In recent years, this process has accelerated. In February 2016 The Chinese ChemChina acquired the Swiss Syngenta, one of the industry leaders in terms of sales and market share. In August 2017 there was a merger of two US companies: DuPont and DowChemicalCo (DuPont in the top six in sales and market share). The last major event is the takeover by the chemical concern Bayer of the agrochemical company Monsanto. This sharply increased the concentration of the market for agrochemical products, genomodified seeds and biotechnologies. While non- CR-6 firms still maintain their positions in the seed market, their share in the agrochemical market is steadily declining (Journal "Agroinvester" 2020).

Obviously, this event will affect the situation of Russian market participants in these types of products. The Federal Antimonopoly Service agreed to this merger, although it could veto it. The German company in response promised to supply Russian companies with its technology under exclusive licenses (Journal "Agroinvester" 2020).

Against this background, small and medium-sized agricultural enterprises cannot participate in competition as a producer in the markets for agrochemical products, biotechnologies, or seeds and diversification in these areas is excluded. They should focus on other segments where the market structure and the nature of demand are favorable. One such segment is the high-quality food market, referred to as “organic.” This market has not yet formed properly. Quality food can only come across by accident. In this regard, it is not always possible to believe what is indicated on the package.

However, in the near future, this market segment is likely to be institutionally structured and formalized with all rules, rules and restrictions. In this case, barriers to entering and leaving this market will obviously be difficult for large companies because it is difficult to realize the advantage of scale in these segments due to the relatively low demand for these products. Although demand will increase with rising incomes, large-scale production of this type of product will always be less attractive than widespread food production.

In this regard, small and medium-sized enterprises cannot expect economies of scale and other benefits from large production, but they are more flexible in their operations. For them, this segment of production is accessible by entry barriers, it

is attractive for low entry and exit costs, the prospect of growth in the future in unison with the growth of consumer incomes and the fact that the rejection of food decommodification itself gives moral satisfaction. In the global economy, this market exists and operates. Manufacturers of developing countries who work for exports and together have a 50% market share feel comfortable on it (Tumalanov et al. 2019b).

A very promising form of organization of small and medium-sized businesses is cooperation. Analysis of foreign experience shows that a number of major food producers initially organized and continue to work as cooperatives: Agrisa (South Africa), Avebe (Netherlands), LandO′LacesInc (USA), etc. Some after mergers lose their cooperative status, acquire a different status (for example, AlbertaWheatPool, Canada). Co-operating can significantly improve the position of small business manufacturers. Members of large cooperatives are included in the process of the structural market for food and complementary goods of the agricultural sector and become participants in the growth of market concentration in the agricultural and food processing sectors.

Cooperation also takes advantage of the fact that its members have great opportunities to diversify, to penetrate new market segments, often without even direct connection and functional commonality with the main production. Therefore, often organizations that arose as agrarian cooperatives later become multidisciplinary companies, such as CHSInc with a turnover of about $45 billion, the third largest agrarian cooperative in the world.

4 Discussion

The food market, its problems, market regulation, producer support and formation of the organic market are currently being considered by the scientific community quite actively. It was first considered in Western Europe, and then in the USA in the aspect of soil depletion, degeneration of crop varieties, erosion. It was rightly noted that the health of the nation depends on the quality and longevity of the soil (Kuepper 2010). Attention was paid to the cycle and ecological balances of nature (Principles of Organic Agriculture 2017). Organic nutrition and its market in the European Union are viewed as an agricultural sector. It is part of the pan-European regional and national policy as a full component (Schmid 2018). M.L. Vartanova described this market as one within the European Union (Vartanova 2019). T.M. Svechnikova describes the mechanism of its regulation in the countries of North America, Western Europe, peculiarities of production and processing of these products in Russia (Svechnikova 2019). The main trends and growth prospects of this market, its strengths, as well as weaknesses, opportunities and threats are also considered (Krasovskaya and Deev 2018).

However, in addition to these aspects, it would be very interesting to consider the structural evolution of this market in its broader scope, to draw attention to the problems associated with market regulation in the face of WTO restrictions, the opportunities and threats of the global market.

5 Conclusion

1. With the globalization of the market, the situation on the part of both demand and supply is changing rapidly, and sometimes even unexpectedly. The structure of the agro-food market has ceased to be atomistic. The market concentration of most products has increased dramatically. The type of competition approached the oligopoly. There has been widespread diversification. Large companies of related industries, producing seeds, biotechnology, agrochemical products, have in competition a power close to monopoly.
2. Under these conditions, market regulation and industry support policies need to be more flexible and differentiated. The experience of foreign countries shows that it is increasingly oriented to the demand for food and the price of each type on a global scale, as well as based on the social and economic situation of medium and small businesses.
3. In the regulation and support of the industry, it is necessary to switch to a segmental approach, based on what changes have occurred and will occur in the market of each type of agri-food products.
4. Most of all, small and small producers need flexible market regulation and support policies. The institutional organization of regulation and support should be aimed at preserving and strengthening their position in the market, paying special attention to the social significance of employment of this group of the population for most regions of Russia. In this area, it is necessary to fully support the unification of these representatives of agro-business into cooperatives, where they, with a successful organization, can become full-fledged and protected competitors in the market.

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Formation of the Quality and Safety of Meat in the Conditions of Ecological Clusters in the Framework of Developing the Cooperative Movement

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Abstract The cooperative movement is rapidly expanding to all niches of the national economy, in particular to all sectors of agriculture. Poultry farming leads among other branches of agriculture, since it is the leading supplier of low-cost meat products. The production of quality and safe products is vital in the formation and development of environmental clusters in the cooperative movement. It is necessary to carry out objective monitoring of the agricultural enterprises specializing in breeding farm animals and providing sufficient raw material bases. The research aims to single out factors and reasons negatively affecting the quality and safety of products, as well as to suggest ways to correct or eliminate them. Dietary supplements are widely used in the development of ecological clusters as a way to influence critical points in industrial poultry farming. The market of dietary supplements is very capacious and flexible because it always has a free niche for effective innovations. Dietary supplements can balance diets for essential nutrients and macro-and micronutrients, thereby contributing to the normalization of metabolic processes. It is also noted that dietary supplements contribute to saving fodder resources and improve feed intake.

Keywords Environmental clusters · Cooperation · Quality · Security · Poultry meat

JEL Code Q130

1 Introduction

Organic dietary supplements are of particular interest. Among all organic dietary supplements, a special place is given to succinic acid and its derivatives. Succinic acid has proven itself in medical and veterinary practice. The results of numerous studies prove its ability to beneficially affect the biochemical processes occurring in the living organism (Papunidi et al. 2016; Perfilova et al. 2019).

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Dietary supplements are products of different origins that increase the productivity of farm animals under normal conditions of feeding and housing. They are not the main components of the feed and, when introduced into the body of animals, can (1) accelerate their growth and development, (2) ensure increased production from animals per unit of spent feed, and (3) increase the overall physiological resistance to unfavorable external factors (Gracheva et al. 2018; Toranmal et al. 2019).

The most effective supplements are those that have a low cost and high efficiency. Low cost can be achieved by using local resources of raw materials for the production of dietary supplements.

2 Materials and Methods

The paper aims to substantiate the effectiveness of dietary supplements as a way to improve the quality of poultry meat.

The development and implementation of innovative solutions in industrial meat poultry farming using dietary supplements based on succinic acid require a methodical approach to study the pronounced positive effect.

The research methodology includes the stages of testing the dietary supplement while introducing it into the feed of broiler chickens in the conditions of the poultry farm. The research was conducted following regulations set by GOST and technical guidelines. All components of the production experiment were considered, calculated, and analyzed (Abid et al. 2018; Gracheva and Yakupova 2016; Subramanian 2019).

Studying the effect of succinic acid on the development and productivity of farm animals and poultry is an important and paramount task.

The studies were conducted in the conditions of the poultry farm. The research object is broiler chickens kept under standard conditions of poultry farm in compliance with all zoological and hygienic requirements (including the microclimate of the place, the form of feed, and water supply). Two groups of chickens were identified for the experiment. The groups were selected according to the principle of analogy. The first group was a control group that received a standard diet. The other group was an experimental group that received a supplement of succinic acid at a dose of 25 mg per kg of live weight to the standard diet.

On the 39th day of the experiment, the poultry was slaughtered, taking into account the live weight. Slaughter products were evaluated according to the rules of veterinary and sanitary expertise (Shabunin et al. 2013). The appearance of meat, degree of exsanguination, texture and structure of muscle tissue, and odor were determined. Moreover, we sampled red and white meat and evaluated the condition of the broth, taking into account the nature of flakes and fatty droplets on the surface (Papunidi et al. 2019). We also used methods of physical and chemical examination of poultry meat. The results were analyzed and processed.

3 Results

The result of the experiment always depends directly on the accuracy of all stages, the qualifications of the researchers, and the accuracy of calculations and processing of the results.

The results indicate that the introduction of dietary supplements to the diet increases the quality of meat and livestock weight gain, which certainly increases the commercial characteristics of raw meat.

Based on the obtained results, their processing, and analysis, we can conclude that the introduction of succinic acid in the diet of farm poultry at a dose of 25 mg per kg of live weight increases the growth of muscle tissue, thereby increasing productivity and improving the quality indicators.

Analyzing the results, we considered and prevented all the factors that could negatively influence the correctness of the data obtained. It was noted that the weight of the chickens in the control group was slightly lower than that of the experimental group, which may indicate the positive dynamics of weight gain due to the addition of succinic acid to the diet. When examining the organoleptic characteristics of the poultry meat from both groups, we noted that the meat has a crust of drying, which is typical for fresh poultry meat. The color of the meat varied from pale to bright pink, the texture was dense, the dimple from pressing with a finger aligned, and the smell was characteristic of fresh poultry meat. It was noted that the meat of the chickens who received amber acid had pronouncedly improved indicators relative to the meat of the control group: the color of the meat was pale pink, and the texture was dense (pressure dimple was leveled in a few seconds). The meat of chickens in the control group had a brighter pink color. When determining the texture of poultry meat in the control group, it was noted that the dimple smoothed out within one to two minutes.

The broth from the meat of both groups was fragrant with fat droplets on the surface. However, the broth from the meat of the experimental group was transparent, while the broth from the meat of the control group had slight flakes. In general, the broths from the meat of both groups were fragrant, sufficiently transparent. The occurrence of several flakes is explained by the denaturation of protein, which is acceptable.

Table 1 presents the results of the organoleptic examination of the meat of broiler chicken.

Of the physical and chemical parameters in the chicken meat, we determined pH, peroxidase reaction, and the content of ammonia and ammonium salts. The indicators were determined using standard methods.

The results of studying the physical and chemical parameters of the poultry meat are presented in Table 2.

The data presented in Table 2 shows that all the studied indicators meet the requirements for fresh poultry meat. The result of the peroxidase reaction was blue-green staining that turned brown within a minute. Such a color change confirms the activity of the peroxidase enzyme and the freshness and quality of the meat. The reaction on the content of ammonia and ammonium salts confirmed that the meat is fresh;

Table 1 Results of organoleptic examination of the meat of broiler chicken

Indicator	Group	
	Control group	Experimental group
Drying crust	Drying crust is characteristic of fresh poultry meat	Drying crust is characteristic of fresh poultry meat
Color	Bright pink	Pale pink
Texture	The dimple from pressing with a finger aligns within a few seconds	The dimple from pressing with a finger aligns within a few minutes
Smell	Characteristic of fresh poultry meat	Characteristic of fresh poultry meat
Broth	Fragrant, with fatty droplets on the surface, slight flakes	Fragrant, with fatty droplets on the surface, transparent

Source Compiled by the authors

Table 2 Results of studying physical and chemical parameters of the meat of broiler chicken

Indicator	Group	
	Control group	Experimental group
pH	6.0 ± 0.04	5.80 ± 0.06
Peroxidase reaction	Negative	Negative
Content of ammonia and ammonium salts	Negative	Negative

Source Compiled by the authors

the extract takes on a greenish-yellow color with the preservation of transparency or slightly blurred. The pH in the meat of chickens from both groups was in the range of 6.0–5.80, which can be justified by the fact that the maturation of meat occurred according to the scheme typical for fresh poultry meat (Abid et al. 2018).

Based on the results presented, it is clear that organoleptic and physical and chemical parameters remain within the standards for fresh meat of healthy poultry; there is even an improvement in some cases. Therefore, dietary supplements based on succinic acid can be recommended for use in feeding poultry.

4 Discussion

There is a need for a regular stimulation of the main components of the cooperative movement in the enterprises of the ecological cluster to ensure its systematic and prospective development. Poultry enterprises are leading in the livestock market. Thus, they attract the close attention of the economic core of the country. The intensification and modernization of enterprises are impossible without the effective use of resources in this sector (Shabunin et al. 2013).

Industrial poultry farming is the initial and fundamental stage that ensures the economic efficiency of the produced product, its quality, and environmental friendliness (Zakirova et al. 2016).

The use of dietary supplements extensively covers and largely systematizes the process of poultry farming (Papunidi et al. 2019). The application of dietary supplements can reduce the cost of feed and increase production volumes. As a consequence, high-quality, safe products, and high profitability are guaranteed at the output.

Our research shows that the results meet our expectations. The quality of the meat of chickens receiving succinic acid as an additive has improved indicators. This data allows us to record a positive trend and continue our research to achieve maximum results in this sector.

5 Conclusion

Summarizing the results of our study, we argue that the use of succinic acid at a dose of 25 mg per kg of live weight has a positive dynamic on the gain of poultry weight gain and the quality of poultry meat. The positive result is directly related to the chemical composition of the dietary supplement and the peculiarities of its effect on the physiological and biochemical processes in poultry. The use of succinic acid in poultry diets will contribute to the intensification of poultry productivity, increase in weight gain. Moreover, it will allow to save on feed and increase the profitability of production.

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Implementation of the Strategy for Sustainable Development of Cooperation Using a Balanced System of Indicators

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Abstract Successful development of cooperation focused on sustainable development is impossible without competent strategic management. The article presented is devoted to the implementation of the strategy of sustainable development of cooperation with the application of a system of balanced indicators. Balanced Scorecard (BSC) is a system that reflects financial and non-financial indicators, as well as includes the internal and external aspects of the development of the organization. The system of balanced indicators will transform the strategy of sustainable development of cooperation into concrete strategic activities. Based on empirical experience, the "prospects" inherent in the presentation of a balanced system of indicators ("Finance," "Customers." "Processes," "Capacity") are adapted for the development of strategies for the sustainable development of cooperation. The benefits of a balanced scorecard are that it goes beyond financial objectives and indicators and focuses on staff capacity. Following a system of balanced indicators will allow both individual organizational cooperative units and cooperatives as a whole to achieve their goals in accordance with the strategy of sustainable development. The use of a system of balanced indicators for the implementation of the strategy for the sustainable development of cooperation will allow management to translate strategic goals into the lower levels of the organizational structures that make up the cooperative association.

Keywords Cooperation · Sustainable development · Strategy · System of balanced indicators

JEL Codes O20 · Q10

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1 Introduction

The success factor of modern cooperation depends on the strategy of sustainable development. There are many theoretical and practical methods for developing and implementing a sustainable development strategy, among which is the system of balanced indicators, developed by R. Kaplan and D. Norton. The presentation of the strategy for the sustainable development of cooperation using the logic of balanced indicators will allow building a model of the strategic management process, which will ensure a balanced consideration of all significant aspects of the cooperative business.

Some aspects of the problem under study are considered in Introduction of the balanced system of indexes (Альпина Business of Axle-bearing 2008) and in the work of D. Norton (Norton and Kaplan 2012)

2 Materials and Method

The implementation of the strategy for sustainable development of cooperation through the lens of a system of balanced indicators begins with the verification and evaluation of the strategy in order to identify strategic information and fill possible gaps. In this context, a strategic analysis methodology is used. Let us present the sequence of evaluation of the strategy of sustainable development of cooperation (Table 1).

The logic of assessing the strategy for sustainable development of cooperation will provide answers to important questions, such as:

- what values are at the heart of the strategy?
- what results are expected when the strategic objectives are successfully achieved?
- what are the horizons of strategic and operational planning?

Table 1 Evaluation sequence of the strategy for sustainable development of cooperation

Strategy evaluation phases	Goals	Methods
Getting to know the Strategy	Studying and understanding the official strategy	Document Analysis Questionnaires Participation in meetings
Test Strategy	Strategic Orientation Assessment	SWOT Analysis ABC-Analysis Strategic Analysis
Common understanding of strategy	Define Strategic Baselines	Meetings Understanding Key Items Coordination with management decision makers

Source Compiled by the authors

– what is the basis of the strategy? (legislation, technology, resources, etc.)
– what strategic areas of activity are priority?
– which market segments are most relevant for strategy implementation?
– what factors constitute a competitive advantage?
– others.

A qualitative assessment of the strategy for sustainable development of cooperation is the basis for the development of a system of balanced indicators.

The thematic sections of the strategy for sustainable development of cooperation should be presented through the "perspectives" of a balanced system of indicators. The formation of strategic goals, the definition of indicators (indicators) and the development of strategic measures on prospects are aimed at avoiding an imbalance in the consideration of the activities of the cooperative association. Let us consider an example of a system of balanced indicators of a conditional cooperative organization (Table 2).

The presented prospects of the system of balanced indicators of a conditional cooperative organization are connected by a causal chain of strategic goals and are in a certain hierarchy. A competent goal is important in determining the strategy for the

Table 2 Cooperative organization balanced performance system (excerpt)

Strategic perspectives	Strategic objectives	Indicators
"Finance" Perspective	Stable functioning and development of cooperation through balanced financial policies Ensuring financial security …	Indicators of financial stability …
"Customers" Perspective	Customer orientation Attraction of cooperative shareholders through discount and preferential programs …	Price - Product Quality Ratio Scope of implementation …
"Processes" Perspective	Create a single brand Creation of all-Russian cooperative trade chain works Create a single logistics environment …	Number of new outlets Logistics Costs …
"Potential" Perspective	Development of the chain university of cooperation Development of cooperative enterprise ecosystem …	Introduction of promising educational programs of both basic and FVE Improving work quality and productivity …

Source Compiled by the authors

sustainable development of cooperation. The process of building a balanced scorecard allows the objectives to be specified on the basis of various strategic initiatives and analytical developments.

Indicators of the system of balanced indicators can be expressed both in financial form and in non-financial verbal format. The variety of activities of cooperative organizations, a number of which are historically characteristic only of consumer cooperation, for example, procurement, requires the development of individual balanced indicators, the System of Balanced Indicators will take into account regional features of the development of cooperation. It is worth noting that in general, the set of abovementioned approaches for the development of a system of balanced indicators is used to implement a single strategy for the sustainable development of cooperation.

All indicators presented in the system of balanced indicators should have targets that can be achieved through the development of coherent strategic activities.

Strategic interventions help to understand and detail strategic objectives arising from strategic objectives. An important aspect of strategic interventions is the choice of cascading. Strategic objectives can be targeted to specific offices and staff, thus contributing to internal impact. Special attention should be given to the allocation of available resources in the formulation of strategic activities.

The understanding and vision of the strategy for sustainable development of cooperation are reflected in the system of balanced indicators through all strategic activities. Strategic interventions should be cross-cutting only if they had the expected impact.

Strategic activities should be divided into stages. We will present strategic actions to coordinate the implementation of the strategy for the sustainable development of cooperation (Table 3).

The cascading process is important for the success of strategic activities that will lead to the achievement of strategic objectives.

The objectives of cascading the balanced scorecard are:

Table 3 Strategic actions in the system of balanced indicators aimed at specifying the strategy for sustainable development of cooperation

Stages	Strategic activities	Comments
I	Strategic objectives based on a strategy for sustainable development of cooperation	Concretization of objectives by areas of activity, by organizational structures, etc
II	Specificity of strategic objectives	Transfer of objectives to specific employees - heads of departments
III	Definition of strategic indicators and their target values	Development of business plans, budgeting, allocation of resources in order to achieve the target parameters of the strategy for sustainable development of cooperation
IV	Adaptation of strategic activities	Analysis of results, strategic training

Source Compiled by the authors

– development of strategic balanced indicators for each activity of the cooperative organization;
– delegation of responsibility for specific tasks;
– identification of the contribution of a specific division to the implementation of the strategy;
– motivation and encouragement of employees in terms of strategy implementation;
– focusing business processes on strategic goals.

Cascading in the balanced scorecard is organized in the following sequence:

1. Definition of cascading structure based on the organizational and management structure of the cooperative organization.
   The approach to structuring can be different: either by areas of activity (for example, trade, procurement, etc.), or by centers of responsibility, or otherwise.
2. Define cascading method for each organizational structure.

Cascading metoles depend on the different situations, goals and objectives of the cooperative organization structure.

3. Cascading according to the selected method. The technology of cascading methods application for purposes of organizational and management structure of cooperative organization consists in combination of methods,
4. Alignment of strategic objectives among cascading units to neutralize strategic issues.
5. Monitoring and documenting the quality of strategic results from the implementation of the system of balanced indicators for the strategy for the sustainable development of the cooperative organization.
6. Integration of the results of structural units into the system of harmonizing the strategic goals of the sustainable development of the cooperative organization and into the system of remuneration.
7. Consolidation of strategic results in the planning and reporting systems of cooperative organizations.

The next important step in the development and implementation of a system of balanced indicators is the development of a strategic map, which is necessary to determine and document the causal relationships between the strategic goals of sustainable development of cooperation. For each perspective of the system of balanced indicators, different methods of determining causality are used, the options for which are presented below (Table 4).

It is advisable to adopt an eclectic approach to using the methods considered, which will give a better understanding of the strategy for the sustainable development of cooperation, which is based on a system of sponsored indicators.

Table 4 Representation of cause and effect relationships in the strategic map, based on the interrelationship of strategic objectives and perspectives of the balanced scorecard

Representation of cause and effect relationships	Building cause and effect relationships	Meaning
Variant 1	Based on strategic goals perspective "Potential"	The method gives the role of the foundation of this perspective in the entire strategy for the sustainable development of cooperation It is assessed how each goal of the perspective is interlinked with the rest of the goals of its perspective, and then analysed how this goal affects the implementation of all strategic goals
Variant 2	Based on selected strategic vision objectives "Finance" (deductive algorithm)	The method is based on a deductive principle, that is, the goals of the perspective under consideration are made on components that are connected by a causal sequence by a hierarchical approach
Variant 3	Based on selected strategic vision objectives "Finance" (inductive algorithm)	The method is based on the elaboration of the objectives of the lower hierarchical levels with a view to their relationship with the upper strategic financial objectives of this perspective and further analysis of the linkage with the objectives of other strategic perspectives
Variant 4	Based on selected strategic vision objectives "Clients"	The method is based on the significance of the client perspective goals. The evaluation of the objectives of this perspective is carried out in the context of its relationship with other objectives of this perspective, and in the future the algorithm is based on the assessment of the impact of the objectives of the remaining prospects on the achievement of the client-perspective parameters

(continued)

Table 4 (continued)

Representation of cause and effect relationships	Building cause and effect relationships	Meaning
Variant 5	Based on the relationship between individual strategic objectives using a cause-effect matrix	The matrix method is based on a multi-variant correlation and provides an idea of all the relationships between the strategic goals of a cooperative organization's sustainable development

Source Compiled by the authors

3 Results

Strategic planning as part of the development of a system of balanced indicators should include interim periods for the revision and refinement of the strategy, as well as the forecasting of strategic indicators. Internal reporting by cooperative organizations, based on a system of balanced indicators, can be developed on the basis of the GRI (Global Reporting Initiative) principles for sustainable development.

4 Conclusion

A reporting system based on a balanced system of indicators allows for more effective identification of strategic objectives of activities, the development of activities necessary to achieve the goals and their successful implementation, thereby increasing the effectiveness of the management system of cooperative organizations.

Cascading in the sequence outlined will contribute to the effective process of achieving strategic objectives.

The implementation of a strategy for the sustainable development of cooperation using a system of balanced indicators will have a synergistic effect, which will allow cooperative associations to respond quickly and adequately adapt to changes in the economic environment.

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Assessing the Participation of Consumer Cooperation in Achieving Sustainable Development Goals

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Abstract The purpose of the article is to develop a methodological tool for assessing the participation of consumer cooperation in achieving sustainable development goals. The UN General Assembly adopted a resolution emphasizing the contribution of cooperatives to the achievement of social development goals and noting the need to support and further develop cooperatives and the cooperative movement. Cooperatives make a significant contribution to the sustainable development of society. The authors proposed a system of indicators for assessing the participation of consumer cooperative organizations in achieving the SDG, which allows assessing the contribution of cooperatives to achieving their goals. In order to obtain a comprehensive assessment of the participation of consumer cooperation in the achievement of sustainable development goals, it is proposed to determine a comprehensive index of achievement of the goal. The study analyzed the contribution of consumer cooperation organizations to the achievement of sustainable development goals, identified factors influencing the dynamics of certain indicators of the activities of cooperative organizations, and considered the directions of their activities to achieve sustainable development goals. The analysis was carried out on the basis of statistical reports of the Central Union of the Russian Federation for 2016–2019 years. The directions of work of the Central Union on participation in state programs aimed at realization of sustainable development goals are shown. The methodological basis was the methods of system analysis, synthesis, economic and statistical methods, such as index, grouping method, construction of dynamic series, graphical and integral estimation. During the study, a comprehensive index of achieving the goal of sustainable development was calculated according to the Central Union of the Russian Federation, which made it possible to determine the participation of cooperative organizations in achieving individual SDG. The proposed methodological toolkit allows assessing, both in general, the Central Union system of the Russian Federation and

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for each consumer union in order to assess the degree of its participation in achieving the SDG.

Keywords Scorecards · Organization of consumer cooperation · Sustainable development goals · SDG · Achievement of sustainable development goals

JEL Codes Q01 · P13 · M21

1 Introduction

The Sustainable Development Agenda 2030, adopted by the United Nations in New York in September 2015, established the Sustainable Development Goals (SDG), a set of actions for all countries of the world to improve global welfare and protect the planet. The achievement of the IMC in Russia is facilitated by the national development goals of the country for the period up to 2030, approved by Presidential Decree No. 474 of July 21, 2020, which directly echo the goals of sustainable development.

Consumer cooperation participates in the implementation of priority national projects and solving national tasks on issues of food security, stabilization and growth of the consumer market, social infrastructure of the village; increasing employment, ecology, which is in line with the goals of sustainable development.

In this regard, the problem of analysing and assessing the contribution of cooperatives to the achievement of the SDG is a pressing one.

Research in the field of cooperation and sustainable development was carried out by the authors: Isaenko (2006, 2019, 2015), Sayamov (2020), Smirnova (2019), (Teplov 2019, 2005, 2016; Teplov et al. 2016), Tarasova (2005, 2019, 2015; Teplov et al. 2016), Ursule (2016), Shishkin (2012), Alyabieva (Teplov et al. 2016), Belenov (Teplov et al. 2016), Degtyar (2015), Makrinova (2019), (Matuzenko 2019; Teplov et al. 2016), Rozdolskaya et al. (2019).

However, there was no integrated assessment of the participation of consumer cooperation organizations in achieving sustainable development goals.

2 Methodology

The methodological basis was the methods of system analysis, synthesis, economic and statistical methods, such as index, grouping method, construction of dynamic series, graphical and integral estimation. The study used the works of domestic and foreign scientists, as well as materials from periodicals and the Internet.

3 Results

Taking into account the contribution of cooperatives to economic, social and environmental problems, a system of indicators is proposed to measure the participation of consumer cooperatives in achieving sustainable development goals, which allows assessing the contribution of cooperatives to each SDG (Fig. 1). The main approach to the selection of indicators is the availability of data in the open statistical reporting of the Central Union of the Russian Federation.

During the research, the participation of cooperative organizations of the Central Union of the Russian Federation in achieving the IMC according to the proposed indicator system was analyzed.

Consumer cooperation organizations serve mainly the rural population. In 2016, the share of the poor in rural areas exceeded the share of the urban population and amounted to 52.2%, and in 2019 it amounted to 50.9%.

One of the indicators of the evaluation of the SDG "eradication of poverty" is the indicator—the share of non-food goods in retail trade. The increase in this indicator is indicative of an increase in the standard of living of the population. For the period 2016-2019, the consumer cooperation system increased this indicator from 22.3 to 22.4% (Table 1).

The achievement of this SDG is facilitated by attracting the population to work in the organization of consumer cooperation with fixed wages, which contributes to the growth of their monetary income.

Purchases of agricultural products and raw materials from the population by consumer cooperation organizations also contributed to the growth of monetary incomes of the served population. In total terms in 2019, the volume of purchases amounted to 22,559 million rubles, however, for 2016–2019 there is a negative trend. The Central Union of the Russian Federation has set the task of developing procurement activities, which will have a positive impact on improving the well-being of the served population.

A characteristic of poverty eradication, like SDG, is an analysis of the dynamics of the number of cooperative markets that attract local people and collective (farmers) to the sale of products. The number of existing cooperative markets in 2019 was 140.

By selling food products, producing certain types of food products, organizing catering activities, cooperative organizations contribute to the achievement of the SDG "eradication of hunger."

In 2016-2019, there was a decrease in sales of food products of consumer cooperation by 25.88%, public catering turnover by 13.71%, as well as food production by 16.64%. The share of food products in retail trade during the analyzed period remained significant (in 2019—77.6%).

Consumer cooperation organizations purchase environmentally friendly products and raw materials from the local population, process them at industrial enterprises and catering enterprises and sell their own products, which plays an important role in improving health and well-being, providing the population with a healthy diet, thereby contributing to the achievement of the SDG "good health and well-being."

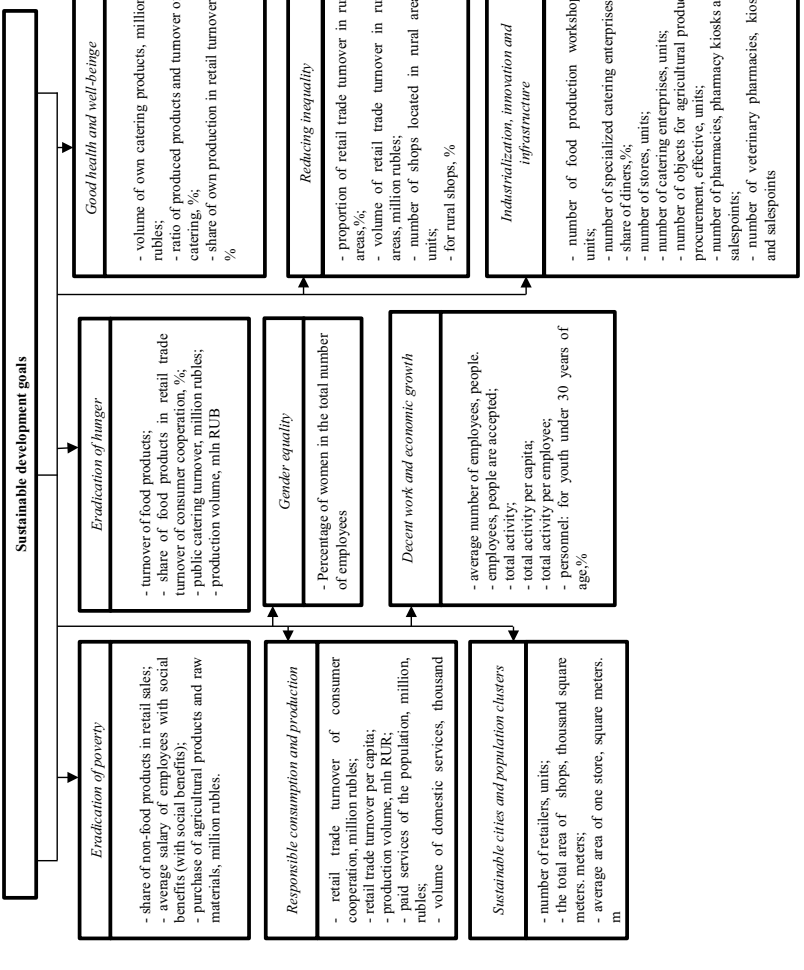

Fig. 1 System of indicators for assessing the participation of consumer cooperation organizations in achieving the SDG. *Source* Compiled and built by the authors according to Sayamov (2016)

Table 1 Dynamics of indicators of achievement SDG "eradication of poverty," "eradication of hunger," "good health and well-being" according to the system of the Central Union of the Russian Federation for 2016–2019 years

Indicators	2016	2017	2018	2019	Deviation (+, −) 2019 from 2016	Deviation (+, −) 2019 from 2018	Growth rate,% 2019 by 2016	Growth rate,% 2019 by 2018
Eradication of Poverty								
Share of non-food products in retail trade	22.3	22.2	22.3	22.4	0.1	0.1	100.45	100.45
Average salary of employees with social benefits	15,544	16,832	18,540	20,247	4703	1707	130.26	109.21
(with social benefits)	25,354	24,417	24,417	22,559	−2795	−1858	88.98	92.39
Number of markets, total	181	153	147	140	−41	−7	77.35	95.56
Eradication of Hunger								
Food turnover	1,19,167	1,04,791	99,219	88,325	−30842	−10894	74.12	89.02
Share of food products in retail trade of consumer cooperation, %	77.7	77.8	77.7	77.6	−0.1	−0.1	99.87	99.87
Public catering turnover, million rubles	15,078	13,783	13,703	13,011	−2067	−692	86.29	94.95
Volume of production, million rubles.	22,795	21,254	20,935	19,001	−3794	−1934	83.36	90.76

(continued)

Table 1 (continued)

Indicators	2016	2017	2018	2019	Deviation (+, −) 2019 from 2016	Deviation (+, −) 2019 from 2018	Growth rate,% 2019 by 2016	Growth rate,% 2019 by 2018
Good health and well-being								
Volume of own catering products, million rubles.	12,435	11,672	11,458	11,253	−1182	−205	90.49	98.21
Ratio of produced own products and turnover of catering, %	82.6	84.7	85.7	86.5	3.9	0.8	104.72	100.93
Share of own production in retail turnover,%	10.8	12.1	12.0	11.9	1.1	−0.1	110.19	99.17

Source Compiled and built by the authors according to Central Union of Consumer Societies

In 2019, according to the consumer cooperation system, the share of own-made products in retail turnover amounted to 11.9%, and the share of own products in public catering turnover—86.5%.

SDG "gender equality" is characterized by the creation of equal social opportunities for men and women. The share of women in the total number of employees in consumer cooperation organizations in 2016 was 76.3% and increased to 76.9% in 2019 (Table 2).

The cooperative organizations make a certain contribution to realization of SDG "decent work and economic growth". Negative dynamics of total volume of activity for the studied period (decrease by 21.04%) and also cumulative activity volume per capita (decrease by 21.34%) demonstrate lack of economic growth. The increase in productivity of work for the studied period for 21.85% can be considered as positive aspect in spite of the fact that first of all it is caused by decrease in number of workers, but not increase in volumes of activity. The great value in achievement of this purpose plays involvement of workers in the organization, especially youth. The youth share in the total number of workers in the system of consumer cooperation made 8.3% and the trend of its decrease for the studied period is noted.

Table 2 Dynamics of indicators of SDG achievement "gender equality," "decent work and economic growth" according to the system of the Central Union of the Russian Federation for 2016–2019 years

Indicators	2016	2017	2018	2019	Deviation. (+, −) 2019 from 2016	Deviation (+, −) 2019 from 2018	Growth rate,% 2019 to 2016	Growth rate,% 2019 to 2016
"*Gender equality*"								
Percentage of women in the total number of employees,%	76.3	76.3	76.6	76.9	0.6	0.3	100.79	100.39
Decent work and economic growth								
Total activity	2,40,185	2,16,709	2,07,823	1,89,648	−50,537	−18,175	78.96	91.25
Total activity per capita	1.64	1.48	1.42	1.29	−0.35	−0.13	78.66	90.85
Total activity per employee	1.51	1.70	1.80	1.84	0.33	0.04	121.85	102.22
The average number of employees, people.	1,53,915	1,28,138	1,15,570	1,03,002	−50,913	−12,568	66.92	89.13
Personnel: share of youth under 30 years old,%	11.1	10.1	9.2	8.3	−2.8	−0.9	74.77	90.22
Accepted workers, people	27,970	24,325	22,579	20,833	−7137	−1746	74.48	92.27

Source Compiled and built by the authors according to Central Union of Consumer Societies

The organizations of consumer cooperation, developing the material and technical resources, improve infrastructure, introduce industrial technologies in production activity, thereby making a certain contribution to achievement of SDG "industrialization, innovations and infrastructure" (Table 3).

In the system of consumer cooperation, the number of objects of the material and technical base is significant, but it tends to decrease during the study period.

Within the framework of the national program "Digital Economy of the Russian Federation," the Central Union of the Russian Federation creates a digital cooperative ecosystem that contributes to the creation of a stable and safe infrastructure. Moreover, the Central Union of the Russian Federation, within the framework of the Logistics project, is working to create logistics infrastructures that will serve not only consumer cooperation enterprises, but also small and medium-sized enterprises.

Table 3 Dynamics of indicators of SDG achievement "industrialization, innovation and infrastructure," "reduction of inequality," "sustainability of cities and settlements," "responsible consumption and production" according to the system of the Central Union of the Russian Federation for 2016–2019 years

Indicators	2016	2017	2018	2019	Deviation. (+, −) 2019 from 2016	Deviation (+, −) 2019 from 2018	Growth rate,% 2019 to 2016	Growth rate,% 2019 to 2018
Industrialization, innovation and infrastructure								
Number of stores, units	36,390	31,878	29,715	27,552	−8,838	−2,163	75.71	92.72
Number of catering enterprises, units	4,700	4,017	3,798	3,579	−1121	−219	76.15	94.23
Number of pharmacies, pharmacy stalls and units	244	233	201	169	−75	−32	69.26	84.08
Number of veterinary pharmacies, kiosks and points	335	245	186	126	−209	−60	37.61	67.74
Number of food production workshops	4,398	3,795	3,597	3,399	−999	−198	77.29	94.50
Number of specialized catering companies	3,633	3,071	2843.5	2,616	−1017	−227.5	72.01	92.00
The number of objects for the procurement of agricultural products, effective, units, including: Stores—receiving and procuring points	9,856	7,791	6,797	5,803	−4053	−994	58.88	85.38
Specialized reception stations	665	554	512	470	−195	−42	70.68	91.80
Reducing inequality								
Volume of retail trade turnover in rural areas, million rubles	1,10,844	99,410	90,765	82,120	−28724	−8645	74.09	90.48
Proportion of retail turnover in rural areas,%	72.2	73.8	72.95	72.1	−0.1	−0.85	99.86	98.83
Number of shops located in rural areas, units	29,610	25,818	24,054	22,290	−7320	−1764	75.28	92.67

(continued)

Table 3 (continued)

Indicators	2016	2017	2018	2019	Deviation. (+, −) 2019 from 2016	Deviation (+, −) 2019 from 2018	Growth rate,% 2019 to 2016	Growth rate,% 2019 to 2018
Share of rural stores,%	81.4	81.0	80.95	80.9	−0.5	−0.05	99.39	99.94
Sustainability of cities and population clusters								
Number of retailers, units	38,300	33,535	31,196	28,857	−9443	−2339	75.34	92.50
The total area of stores, thousand square meters	5602.4	4984.5	5048.6	5112.7	−489.7	64.1	91.26	101.27
The average area of one store, square meters	154	156	171	186	32	15	120.78	108.77
Responsible consumption and production								
Retail turnover of consumer cooperation, million rubles	1,53,444	1,34,686	1,27,727	1,13,873	−39,571	−13,854	74.21	89.15
Retail turnover per capita	1.05	0.92	0.87	0.78	−0.27	−0.09	74.29	89.66
Production volume, mln RUB	22,795	21,254	20,935	19,001	−3,794	−1,934	83.36	90.76
Volume of paid services to the population, million rubles	5,240	5,152	3,621	5,217	−23	1,596	99.56	144.08
Volume of domestic services, thousand rubles	4,10,246	24,499	1,48,802	2,73,105	−1,37,141	1,24,303	66.57	183.54

Source Compiled and built by the authors according to Central Union of Consumer Societies

Consumer cooperation, by organizing activities in rural areas, primarily contributes to reducing inequality between rural and urban residents, contributing to the achievement of the SDG "reducing inequality." In the system of consumer cooperation, 80.9% of stores are located in rural areas, their turnover in the total volume of retail trade in consumer cooperation is 72.1%.

The achievement of the SDG cooperative organizations "sustainability of cities and settlements" is characterized by their participation in creating conditions for comfortable service of the population in urban areas, as well as the formation of an environmentally sustainable, inclusive and safe urban environment. The number of retail enterprises operating in cities and settlements in 2019 was 28,857 units, the total area of stores—5112.7 thousand square meters. m There is an increase in the average area of stores from 154 m^2. m in 2016 to 186 m^2. m in 2019.

Achievement of SDG cooperative organizations "responsible consumption and production" was assessed by indicators of retail trade turnover per capita, volume indicators of trade, production and services, which tended to decrease in 2016-2019.

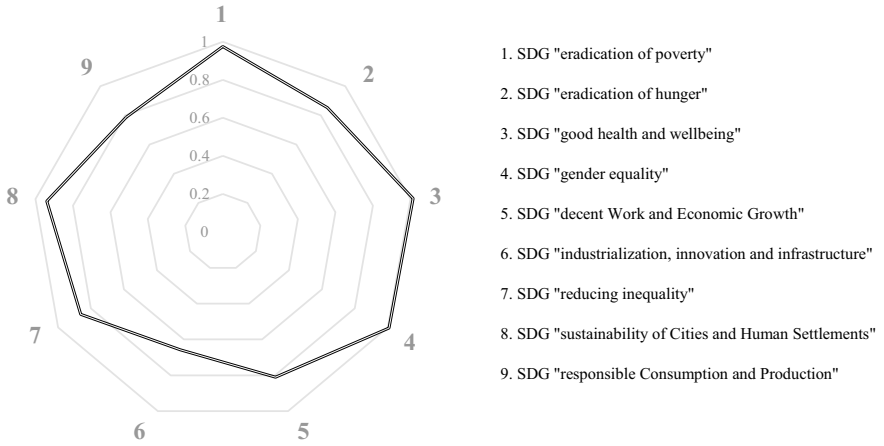

Fig. 2 Comprehensive SDG achievement index for the Central Union of the Russian Federation system for 2016-2019 years. *Source* Compiled by the authors according to Teplov et al. (2016)

The analysis of the progress of indicators for each SDG does not provide a comprehensive understanding of the participation of consumer cooperation organizations in the achievement of SDG.

For the integrated assessment, it is proposed to calculate the integrated SDG (I) achievement index according to the following formula:

$$I = \sqrt[n]{T1 \times T2 \times T3 \ldots\ldots \times Tn}$$

where, Tn—an index of growth to achieve the goal of sustainable development.

The results of the calculation of the comprehensive SDG achievement index for the Central Union of the Russian Federation system are shown in Fig. 2.

In many ways, the objectivity of the assessment depends on the selection of indicators that most accurately reflect the degree of participation of consumer cooperation in achieving sustainable development goals. The criteria for selecting indicators was the possibility of obtaining data from open statistical sources. The calculation did not include all sustainable development goals, due to the lack of statistical information on the contribution of consumer cooperation to their achievement. However, this evaluation methodology is versatile and flexible, with additional information on other SDGs, it allows you to perform the corresponding calculations.

4 Discussion

The research was based on an in-depth study of the sources presented in the economic literature on cooperation and sustainable development, as well as a methodological

approach to assessing the sustainable development of organizations. Based on the results of the debate, a new methodological approach to assessing the achievement of sustainable development goals is proposed, including principles, methods, a system of indicators that allows for a comprehensive assessment of the achievement of SDG by consumer cooperation organizations.

5 Conclusion

According to the results of the assessment, it can be concluded that over the research period 2016-2019, the participation of consumer cooperation organizations in achieving sustainable development goals is significantly higher for SDGs such as "gender equality" and "good health and well-being," since the comprehensive SDG achievement index is greater than 1. For the rest of the SDG, the comprehensive index is less than 1, which indicates the insufficient participation of consumer cooperation in achieving SDG.

Using the proposed methodological tools will help to identify reserves and determine the directions for the development of consumer cooperation organizations to achieve sustainable development goals.

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Sustainable Development of Inbound Tourism in the Russian Federation Following the Pandemic

Olga Y. Ermolovskaya, Elena V. Povorina, and Irina V. Khristoforova

Abstract The relevance of the topic of the research is determined by the need for an objective assessment of the complex, dynamic environment of inbound tourism and the identification of opportunities and threats that need to be taken into account when developing projects for the sustainable development of tourism. The purpose of this work is to study inbound tourism in the Russian Federation, trends in the development of the industry to develop a set of measures aimed at successfully restarting inbound tourism in conditions of stabilization of the epidemiological situation. The leading approach to the study of this problem was the analysis of scientific, theoretical and practical materials of specialists in the development of tourism, the authors of the article used methods of content analysis, analysis of statistics, a systematic approach, expert assessments that allow us to comprehensively consider the problem being studied. Results of the work: An assessment of the dynamics of the inbound tourist traffic and the traffic to the Russian Federation has been investigated factors that have a positive and negative impact on the development of the inbound tourist traffic to Russia. The research made it possible to assess the current and strategic potential of the development of inbound tourism, to generate a set of measures charged with the formation and promotion of a competitive domestic tourist product. The article emphasizes the need to strengthen state support for the development of inbound tourism.

Keywords Inbound tourism · Sustainable development · Tourist traffic · Export services

JEL Codes L83 · Q01 · Z32

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1 Introduction

For several decades, until 2020, tourism was one of the fastest growing sectors of the economy. Today, in the context of the pandemic, this is one of the most affected industries by Coronavirus, characterized by a significant drop in tourist traffic, and especially in the field of inbound tourism. However, this does not mean a decrease in interest in studying the problems of the development of domestic and inbound tourism. On the contrary, today the issues of sustainable development of domestic and inbound in Russia, as in the practice of developed and developing countries (Sobaih et al. 2021), are given priority, a national project for the development of tourism and hospitality is being developed. At the same time, tourism researchers emphasize that tourism development is constrained by systemic problems and contradictions (Chernikova and Faizova 2016). The role of tourism in the Russian economy in the period before the pandemic was insignificant, formed 4.8% of Russia's GDP and in 2020 4.9% (World Data Atlas 2021).

A significant transformation in the directions and size of inbound tourist traffic is the reason for increasing attention to the problems of forming the trajectory of tourism development in the new post-pandemic realities.

Therefore, an objective assessment of the complex, dynamic environment of inbound tourism and the identification of opportunities and threats that need to be taken into account in making strategic decisions aimed at the sustainable development of tourism is needed, which determines the importance of the research direction.

The purpose of this work is to study inbound tourism in the Russian Federation, trends in the development of the industry, to highlight factors that hinder the sustainable development of tourism.

2 Methodology

In this research, the following data were used: United Information and Analytical System of of the Federal State Statistics Service of the Russian Federation (EMIAS); Federal Agency for Tourism of the Russian Federation; Central Bank of the Russian Federation, World Tourism Organization (UNWTO) and expert assessments.

The leading approach to the study of this problem was the analysis of scientific and theoretical, applied research of specialists in the problems of tourism development, statistical materials (Evreinov 2015). In the study, the authors of the article used methods of content analysis, on the problems of tourism development, the authors of the article used methods of content analysis, analysis of statistical data for the period 2011–2018, a systematic approach, expert assessments that allow us to comprehensively consider and propose ways to solve the problem under study.

The outbound tourist traffic over the past decade significantly exceeds the number of inbound tourist trips, in 2018 it amounted to 41,964 thousand trips, with a total of 24,551 thousand trips (Bank of Russia. Foreign trade of the Russian Federation

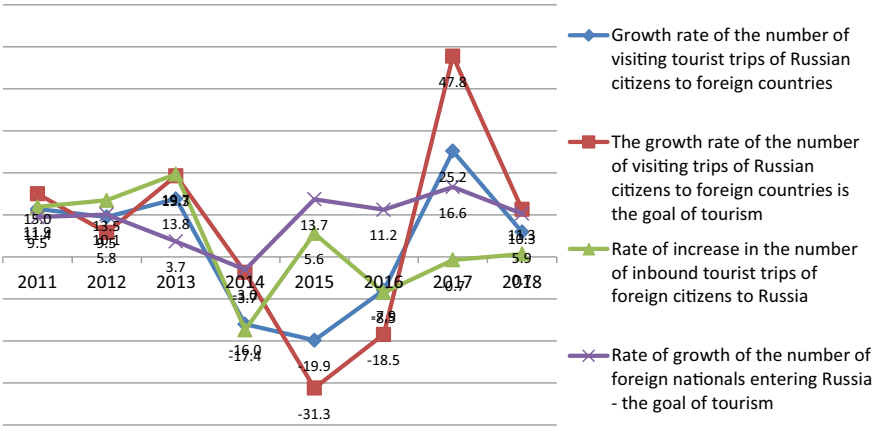

Fig. 1 Dynamic number of tourist trips for 2011–2018, %. *Source* EMISS Russian State Statistics Service, 2019 (Rosstat 2019)

in services(2018)). The exit tourist traffic grew steadily after the global financial crisis during 2009–2013. From 2014 to 2016, due to a sharp decline in the national currency, a deterioration in the geopolitical situation, as well as a restriction on travel to inexpensive popular destinations (Egypt, Turkey), there was a decrease in the exit tourist traffic. Since 2017, there has been an increase, but the number of trips has not reached the level of 2011.

Figure 1 shows the change in the number of entry trips, in general, and only for the purpose of tourism.

During the analyzed period of 2010 - 2018 the largest inbound tourist traffic was recorded in 2013—30,791 thousand people who visited Russia for business, private, tourist purposes, in 2018. Russia was visited by 24,551 thousand people. The number of tourist trips includes trips with business, private, tourist purposes.

A steady increase in the number of entry tourist trips, where the goal is indicated—tourism is noted in the pre-andemic period 2007–2018, with the exception of a decrease in entry travel in 2014 by 3%. The decrease in the number of trips in 2014 is due to an exogenous shock: a change in the situation in Ukraine and an aggravation of relations with the West, sanctions pressure. As noted in a number of studies (Brakke 2004; Nikolaev and Oreshkina 2016), tourist flows are subject to strong fluctuations depending on the foreign policy situation. Against the backdrop of a decrease in the total number of entry tourist trips from 2015 to 2018, there was an increase in entry travel for tourism at the level of at least 10% annually, and in 2018 the entry of foreign citizens for tourism amounted to 4201 thousand people.

Therefore, despite the deterioration of the foreign policy situation in recent years, foreign tourists were interested in the largest international sports events held in Russia, a price policy ensued amid the weakening ruble exchange rate.

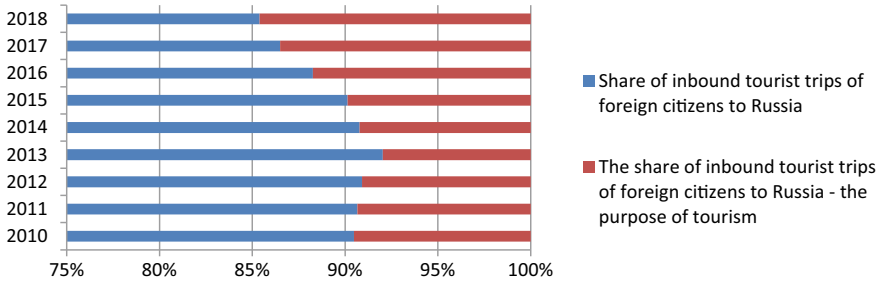

Fig. 2 Structure of entry tourist trips of foreign citizens to Russia for 2010–2018. *Source* EMISS Russian State Statistics Service, 2019 (Rosstat 2019)

As the growth rate of inbound travel for tourism is outstripping the growth rate of inbound travel for business, personal and tourist purposes, this has led to structural shifts in arrival as reflected in Fig. 2.

The share of tourist trips amounted to 17.1% in 2018. As it was noted, large-scale world-class events and state targeted programs, which are being implemented in many regions of Russia, played a great role in this.

The first line in the number of arrivals since 2014 is confidently occupied by China, which is 6.1% of the total number of trips, followed by Finland, Poland, Germany and other countries. Significant growth is noted in the number of trips of foreign citizens from Argentina + 24.35%, Vietnam + 18.49%, India + 20.34%, Canada + 26.21% of China + 14.69%, Korea + 57.7% of Thailand + 58.1%, Turkey + 87.5%. Japan + 20.52%. The decrease in inbound flow was negatively affected by the fall in tourist flow from Latvia − 9%, Lithuania − 9%, Mongolia − 24%, Poland − 29%, Finland −23%, as well as from neighboring countries.

The change in the foreign policy situation led to structural shifts in entry tourist flows, with a decrease in demand for tourist trips to Russia from US Europe, a sharp surge in travel to Russia from China and Korea is noted.

As it can be seen from the data presented in Fig. 3, the leader in the number of citizens who visited Russia for tourism purposes, as well as China in the total number of tourist trips, citizens from this country account for 29% of the total number of foreign tourists.

According to expert estimates, a significant increase in tourist traffic from China is due to the introduction of visa-free tourist trips. If in 2014 about 32% Chinese tourists visited Russia under the visa-free regime, then in 2017 the goal of 63% trips was carried out under the visa-free regime. However, not only the visa-free regime has become a generator of the growth of tourist traffic from China, this is facilitated by targeted work on the formation of a holistic system of a comfortable stay environment. Tourism is the main area for which the struggle in the world economy has been and will continue - both in terms of generating hard currency and the use of soft power. Export of tourism services is one of the directions of development of extra-economic activity (Saryan 2017).

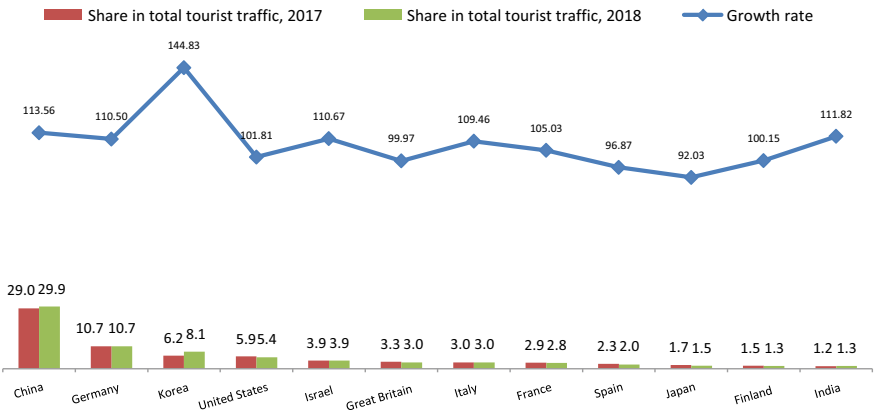

Fig. 3 Dynamics of entry of foreign citizens into the Russian Federation for the year 2017–2018. *Source* EMISS Russian State Statistics Service, 2019 (Rosstat 2019)

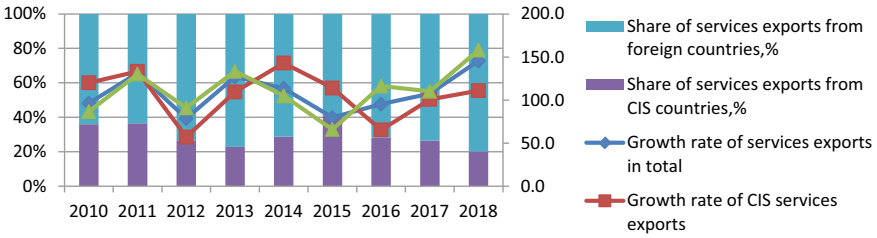

Fig. 4 Structure and dynamics of services exports under personal travel for 2010–2018,% (Foreign trade of the Russian Federation in services 2017, 2018). *Source* EMISS Russian State Statistics Service, 2019 (Rosstat 2019)

After a decrease in the volume of services exports (data from Fig. 4) in 2015, there was a positive trend in the growth of services exports, which is due to an increase in the number of inbound tourist trips, both citizens from abroad and from the CIS. At the same time, the growth rate of services exports from non-CIS countries in the past three years has outpaced the growth rate of services exports from the CIS, which led to structural shifts—the share of services exports from non-CIS countries reached its maximum during the analyzed period and amounted to 79.8% in 2018. Germany accounts for 16%, China—9%, the USA—6.2%,

Israel—5.7% of the total export of services under personal travel.

The increase in services exports in 2018 was significantly influenced by the increase in the number of entry tourist trips to Russia related to the FIFA World Cup 2018. A positive increase in services exports was also affected by an increase in the average expenses of one non-resident traveling to the territory of the Russian Federation (according to the Central Bank of the Republic of Belarus in 2017, the increase was 13%), an increase in the length of stay and travel goals.

Therefore, we note a generally positive trend in the growth of services exports under the article "personal trips", however, the volume of services exports from the CIS countries is lower than the level of 2015–1899 million US dollars (Bank of Russia. Foreign trade of the Russian Federation in services (2018)).

Consider the geography of entry tourist trips of foreign citizens throughout the Russian Federation. Traditionally, the largest number of Russian tour companies accepted foreign tourists in the Russian Federation is noted in St. Petersburg, Moscow and the cities of the Golden Ring. The Khabarovsk Territory, Novosibirsk, Irkutsk and Kaliningrad regions are also among the leaders. There are also new points of attraction, Arctic tourism in particular, development of which is gaining momentum, even though it is not really considered a tourist zone looking at it at first glance (Golubchikov and Kruzhalin 2017).

3 Results

As a result of the research, the following conclusions can be drawn: the restriction of the growth of the inbound tourist traffic is due to: the insufficiently developed infrastructure of land and water transport and tourism infrastructure, the low quality of services provided to foreign tourists; the decrease in tourist flow was influenced by a change in the geopolitical situation, the sanctions regime against Russia, and the intensification of the spread of negative materials about Russia posted by individual foreign media.

Positive factors that led to the growth of tourist flow are: holding world-class sports events in the Russian Federation, state targeted programs for the development of tourism, the construction of infrastructure (in particular, transport, railway, other related, etc.), in the constituent entities of the Russian Federation, visa-free tourist travel programs.

4 Discussion

A large number of works are devoted to the sustainable development of tourism, both in foreign and domestic literature (Forstner 2018; Romão and Neuts 2017; Genderke and Sharapaeva 2019; Makhluf 2019; Telicheva and Chernov 2020). Unlike the previously published works of the authors of article (Bunakov et al. 2015; Ponomareva et al. 2020), this study provides an assessment of the state of the field of inbound tourism in the Russian Federation, revealed trends in the development of the industry to develop a set of measures aimed at successfully restarting inbound tourism in the railings after the pandemic.

5 Conclusion

Based on the research, it can be concluded that in the conditions of stabilization of the epidemiological situation, it will be necessary to develop a set of measures aimed at the successful restart of inbound tourism.

One of the relevant issues in the development of inbound tourism is the liberalization of the visa regime for foreign tourists. The successful experience of holding the World Cup in Russia (ChM-2018 visa-free tourist trips, showed that the combination of simplification of visa formalities with the offer of a tourist product and an effective promotion system gives significant results.

The main direction of increasing the availability of services is the development of the main transport infrastructure and the system of passenger transportation in the direction of tourist territories, which is possible as part of the implementation of the state program for the development of tourism. According to expert estimates, the demand for individual travel and travel in small groups will increase, which must be taken into account in terms of types of tourism, transportation and food, and the safety requirements of travelers.

The next direction of the development of inbound tourism is the activation of the promotion of the tourist brand of the Russian Federation, key tourist territories, routes and tourist products of Russia on the foreign market. Application of innovative technologies, digital platforms combining information on tourist products in the territories of the constituent entities of the Russian Federation, including the possibility of booking accommodation facilities, purchasing tickets for various types of transport, travel insurance pole, excursion tickets, museums and other events and tourist services, as well as the continuation and expansion of the program of direct financial support to the organizers of inbound tourism.

The ability to travel long distances will return. Tourism is likely to become an even more important source of jobs and a catalyst for the creation and development of business, for this it is necessary to form and promote a competitive domestic tourism product.

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Contribution of Enterprise Cooperation to the Sustainable Development of the Economy Through Accelerated Modernization and Increased Corporate Responsibility

Aleksei V. Bogoviz, Svetlana V. Lobova, and Alexander N. Alekseev

Abstract The paper aims to determine the contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate responsibility. The study involves finding the regression dependence of modernization and corporate responsibility on the level of enterprise cooperation in each sample of countries separately. As a result, the authors propose specific recommendations for stimulating enterprise cooperation to achieve sustainable economic development for each sample. A significant positive contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate responsibility is revealed, which is more pronounced in conditionally developing countries (illustrated by the example of the BRICS countries and lagging countries). Besides, the authors prove that both commercial (modernization) and non-commercial (e.g., environmental protection through corporate responsibility) sustainable development goals can be achieved through enterprise cooperation. In conditionally developed countries, at the maximum (100 points, +67.06%) level of cooperation, the highest level of digital modernization of the economy is reached (+87.34%) and a significant (+18.87%) increase in corporate responsibility to 64.74 points. In conditionally developing countries, at the maximum (100 points, +117.06%) level of cooperation, the highest level of digital modernization of the economy (+157.60%) and corporate responsibility (+131.65%) is achieved. In this regard, the authors recommend promoting cooperation in entrepreneurship all over the world.

Keywords Enterprise cooperation · Economy · Sustainable development · Digital modernization · Corporate responsibility

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JEL code C71 · F12 · F15 · J54 · L13 · L24 · L26 · L41 · P13 · Q01

1 Introduction

The cooperation of enterprises is carried out on their own initiative, when they are guided by private and commercial interests, either to maintain a competitive position in an aggressive and adversely changing market environment (e.g., economic crisis) that threatens their existence or to strengthen competitiveness and improve financial performance in a favorable and stable market environment. However, this does not mean that the benefits for society and the economy cannot be achieved through the cooperation of enterprises. Particular attention should be paid to the benefits for sustainable development as the most significant and universal priority of modern economic systems.

Entrepreneurship can contribute to the sustainable development of the economy through two areas of its activity. First, it can be achieved through modernization. Digitalization of individual enterprises promotes the transition of the entire economy to the Fourth Technological Order. As a result, goods and services become more accessible, which helps overcome their scarcity and improve the standard and quality of life of the population—thus, one can reach the sustainable development goals that can be achieved commercially. Second, it can be done through the manifestation of corporate responsibility. Through the implementation of socially significant initiatives, in particular, in environmental protection, enterprises contribute to the implementation of non-commercial sustainable development goals (not related to the production of goods and services).

The enterprise cooperation can potentially contribute to the successful implementation of both of these areas since it allows one to combine business risks, distribute risks, and generate the pressure of the cooperative enterprises on each other, which encourages them to support the sustainable development of the economy. Nevertheless, the real contribution of enterprise cooperation to the sustainable development of the economy is unknown due to the lack of existing empirical research. This paper seeks to fill this gap by identifying the contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate responsibility.

2 Literature Review

Sustainable economic development through accelerated digital modernization of entrepreneurship is considered in the following works (Agyabeng-Mensah et al. 2020; Alpidovskaya et al. 2019. 2019.; 2019a; 2019b; Laptev and Filina 2019.; 2019; 2020). Other works (Akopova et al. 2020; 2019) focus on achieving it through increased corporate responsibility of entrepreneurship.

The basic principles and applied issues of cooperation of enterprises in current economic conditions are reflected in the following papers (Agyabeng-Mensah et al. 2020; Arranz et al. 2019; Franco and Haase 2020; Pereira et al. 2020). Nonetheless, the contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate responsibility is not defined and requires further research, which is the subject of this paper.

3 Materials and Methodology

To obtain the most accurate and informative applied results, the authors use two samples of countries. The first sample includes developed and rapidly developing countries that are referred to as conditionally developed countries. The second sample comprises rapidly developing countries and lagging countries that are referred to as conditionally developing countries. The samples of countries are formed according to the following principle:

- The developed countries include the countries with the highest values of the Sustainable Development Index in 2020;
- Rapidly developing countries comprise the BRICS countries, which are located at the intersection of developed and developing countries;
- The lagging countries are countries with low values of the Sustainable Development Index in 2020 and those occupying the bottom lines of the Digital Competitiveness Rating for 2020.

Figure 1 shows the resulting set of countries.

Table 1 qualitatively characterizes (1) the level of enterprise cooperation (through the "multistakeholder collaboration" indicator calculated by the World Economic Forum); (2) modernization (through the Digital Competitiveness Index calculated by IMD); and (3) corporate responsibility (through the Social Entrepreneurship Index calculated by the Institute of Scientific Communications) in the sample countries in 2020.

The study involves finding the regression dependence of modernization and corporate responsibility on the level of enterprise cooperation in each sample of countries separately. Thus, the authors propose special recommendations for each sample to promote cooperation between enterprises to achieve sustainable economic development.

4 Results

Figure 2 shows the contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate

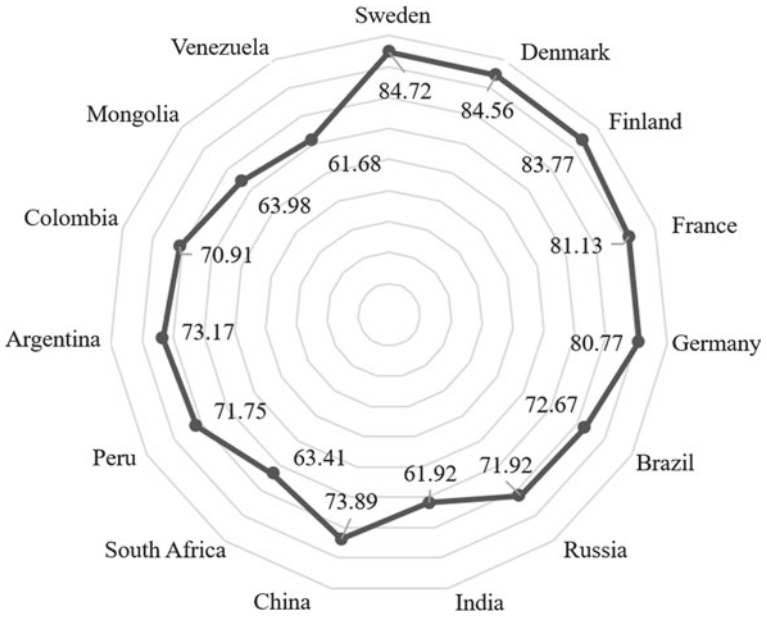

Fig. 1 Sustainable development index in 2020 in the aggregate of the countries included in the samples of this study. *Source* Compiled by the authors based on the following materials (UNDP 2020)

responsibility in conditionally developed countries, and Fig. 3—in conditionally developing countries.

Figure 2 reveals that in conditionally developed countries, with an increase in the level of enterprise cooperation by 1 point, the Index of Digital Modernization (competitiveness) of the economy increases by 1.6096 points (correlation of 78.85%), and the Social Entrepreneurship Index (corporate responsibility) increases by 0.2559 points (correlation of 21.85%).

Figure 2 shows that in conditionally developing countries, when the level of enterprise cooperation increases by 1 point, the Index of Digital Modernization (competitiveness) of the economy increases by 1.4973 points (correlation of 47.59%), and the Social Entrepreneurship Index (corporate responsibility) increases by 0.0446 points (correlation of 46.49%). Based on the obtained regression curves, the authors determined prospects for sustainable economic development based on enterprise cooperation in conditionally developed (Fig. 4) and conditionally developing (Fig. 5) countries.

Figure 4 demonstrates that in conditionally developed countries, with the maximum (100 points, +67.06%) level of cooperation, the highest level of digital modernization of the economy is achieved (+87.34%) and a significant (+18.87%) increase in corporate responsibility up to 64.74 points is reached.

Table 1 Level of enterprise cooperation, modernization, and corporate responsibility in the sample countries in 2020

Category			Country	Level of enterprise cooperation (Multistakeholder collaboration), points 1–100	Index of Digital Modernization (competitiveness) of the economy, points 1–100	Social Entrepreneurship Index (Corporate Responsibility), points 1–100
-	Conditionally developed	Developed countries	Sweden	72.0	95.146	60.923
			Denmark	69.5	96.013	55.713
			Finland	71.8	91.130	53.698
			France	58.3	76.983	55.341
			Germany	70.0	81.062	61.14
Conditionally developing		Rapidly developing countries	Brazil	44.3	52.095	49.027
			Russia	49.5	59.950	61.147
			India	53.3	54.836	54.086
			China	57.3	84.105	46.685
			South Africa	52.6	48.353	46.878
	-	Lagging countries	Peru	36.6	50.120	35.881
			Argentina	42.8	48.784	34.607
			Colombia	45.4	46.450	37.395
			Mongolia	38.5	43.681	36.009
			Venezuela	40.4	23.991	26.203

Source Compiled by the authors based on the following materials (IMD 2020; 2020; World Economic Forum 2019.)

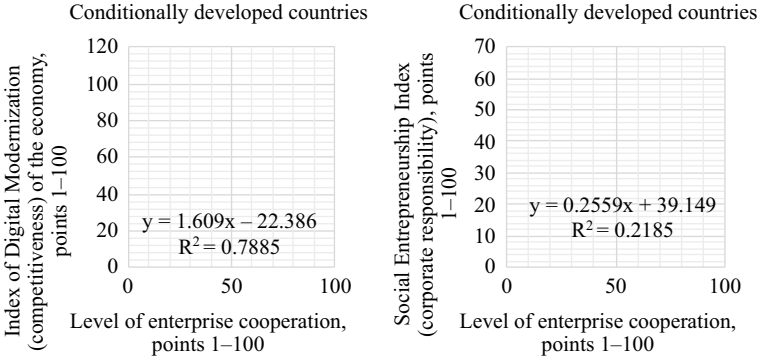

Fig. 2 Contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate responsibility in conditionally developed countries. *Source* Compiled by the authors

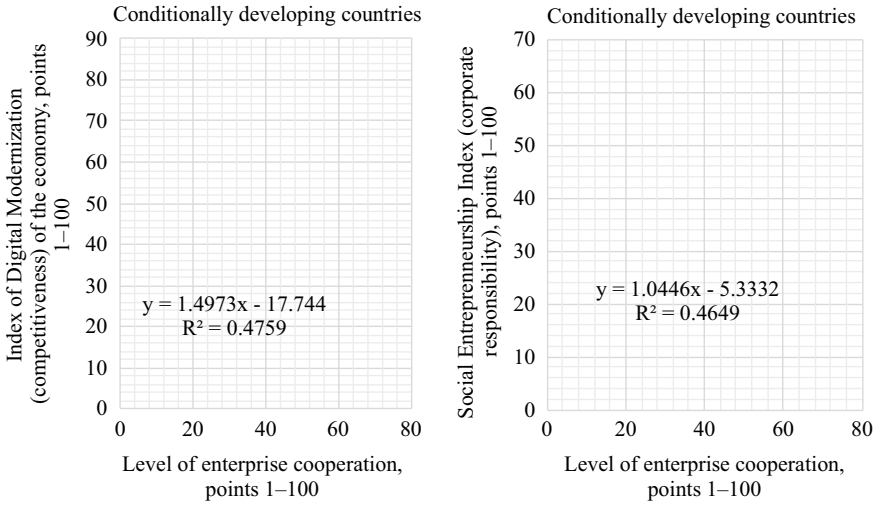

Fig. 3 Contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and increased corporate responsibility in conditionally developing countries. *Source* Compiled by the authors

Figure 5 shows that in conditionally developing countries, at the maximum (100 points, +117.06%) level of cooperation, the highest level of digital modernization of the economy (+157.60%) and corporate responsibility (+131.65%) is achieved.

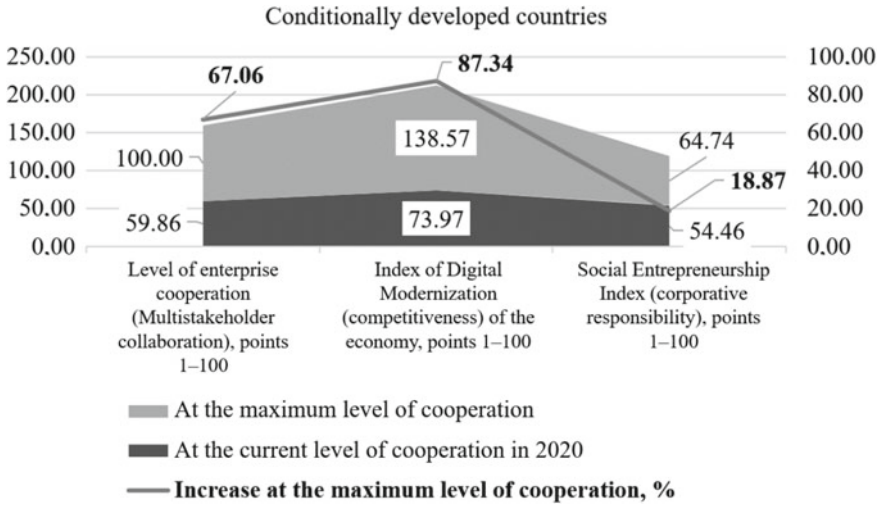

Fig. 4 Prospects for the sustainable development of the economy of conditionally developed countries based on enterprise cooperation. *Source* Compiled by the authors

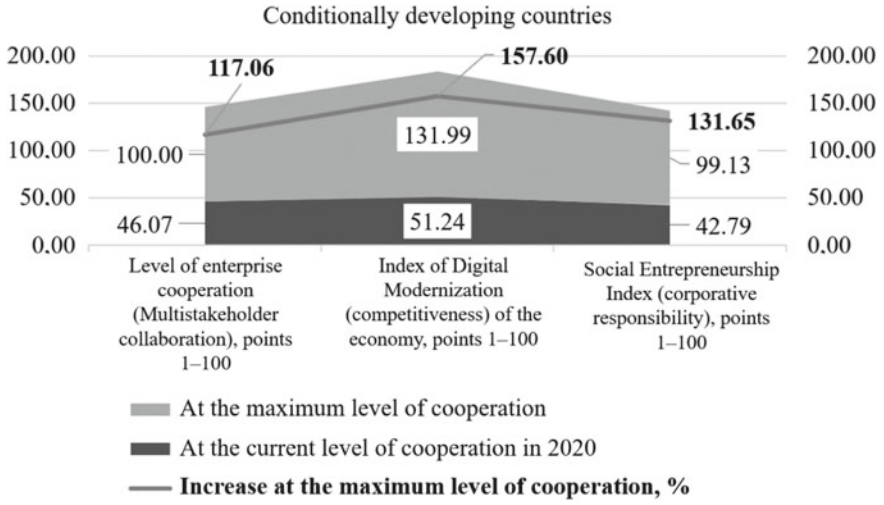

Fig. 5 Prospects for the sustainable development of the economy of conditionally developing countries based on enterprise cooperation. *Source* Compiled by the authors

5 Conclusion

The authors identified a significant positive contribution of enterprise cooperation to the sustainable development of the economy through accelerated modernization and

increased corporate responsibility, which is more pronounced in conditionally developing countries (illustrated by the example of the BRICS countries and lagging countries). Furthermore, the authors proved that both commercial (modernization) and non-commercial (e.g., environmental protection through corporate responsibility) sustainable development goals could be achieved through enterprise cooperation. In this regard, the authors recommend promoting cooperation in entrepreneurship all over the world.

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Specialization and Diversification of Agricultural Production

Evgeny V. Barishevskiy

Abstract The paper aims to assess the level of sectoral diversification and specialization of agricultural production. Specialization and diversification of agricultural production are considered based on statistical reporting data of 26,850 organizations by type of activity 001 "Crop and livestock production, hunting, and the provision of related services in these areas" in accordance with the All-Russian Classifier OKVED. The estimate is based on the ranking of organizations by revenue for 2019. The author identifies the most and least common activities in agriculture and the most and least profitable activities in terms of revenue per one ruble of assets. Multi-branch diversified organizations occupy 8.86% of the total number; their profitability was 37 kopecks of revenue per 1 ruble of assets, which is lower than that of specialized organizations.

Keywords Diversification · Agricultural production · Revenue · Industries · Types of activity

JEL codes L25 · P27 · Q10

1 Introduction

Agriculture is represented by branches (crop and livestock) and sub-branches (by type of activity), i.e. it is a multi-branch complex. Specialization determines the predominant production of one type of product (more than 50%) or several types of products (more than 25%) corresponding to the specific conditions of the farm. In reporting on specialization, organizations refer to types of activities in accordance with the OKVED classifier (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.)). The theory of production organization considers the issues of specialization of agricultural production in current conditions

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and the issues of evaluation of its advantages and varieties. Current conditions in Russia are considered in the textbook by Tushkanov et al. (2021).

Diversification expresses the process of expanding production, penetration into new industries and areas, and expanding the range of products. According to the OKVED classifier, the diversified organizations by type of activity can include 01.5 "Mixed Agriculture." Theoretical foundations of diversification are considered in the works of (Ansoff and McDonnell 1965), (Porter 2014), and many other Russian and foreign scholars—(Rodionova and Karpunin 2013), (Mumladze et al. 2015), and (Lovchikova and Alpatov 2020). Diversification in the rural economy is associated with the expansion of the range of produced products, the development of non-agricultural activities (auxiliary production, crafts, agritourism), and alternative employment. Diversification is the result of implementing specific measures and programs to improve the economic efficiency and competitiveness of agricultural products, which makes its further research relevant, including for the purpose of determining the priority areas of state support.

2 Materials and Methods

The research is conducted based on the statistical reporting data of 26,850 organizations by type of activity in accordance with the Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED) (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.)). The author ranks the organizations in activity type 001 "Crop and livestock production, hunting, and provision of related services in these areas" by revenue in statistical reporting for 2019. The author identifies the most and least common activities in agriculture and the most and least profitable activities by revenue per one ruble of assets. The author applies an ABC analysis of agricultural production activities by their profitability and prevalence.

3 Results

From 26,850 organizations, 5,385 (20.06%) are specialized in the livestock sub-branches, 16,175 (60.2%) in the crop sub-branches, 2,380 (8.86%) organizations are engaged in mixed (diversified) production, 1,380 (5.14%) provide services in plant growing, and 195 organizations (0.73%) are specialized in cattle breeding services.

Figures 1 and 2 show the most common activities in crop and livestock production. The least common activities are the cultivation of earthworms (11 units), breeding pigs (17 units) and poultry (13 units) for meat, cultivation of corn, citrus crops, and flowers in the open and protected grounds (13 units each).

Figures 3 and 4 show the most profitable activities. Profitability in animal husbandry is higher than in crop production—1.61 rubles of income per one ruble of assets in livestock breeding, 1.08 rubles per one ruble of assets in beekeeping.

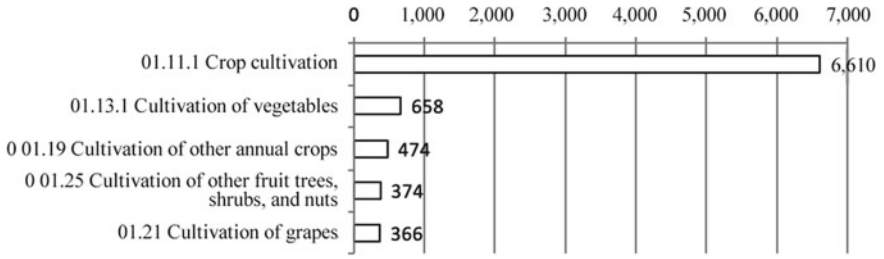

Fig. 1 The number of organizations engaged in the most common activities in crop production, units, 2019. *Source* Compiled by the author based on statistical reports (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.))

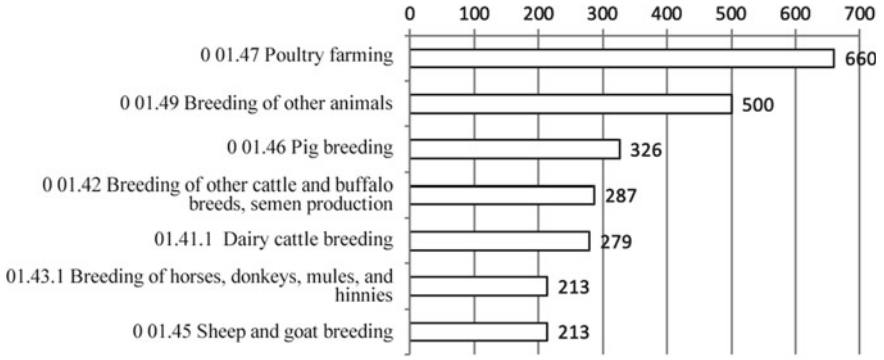

Fig. 2 The number of organizations engaged in the most common activities in animal husbandry, units, 2019. *Source* Compiled by the author based on statistical reports (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.))

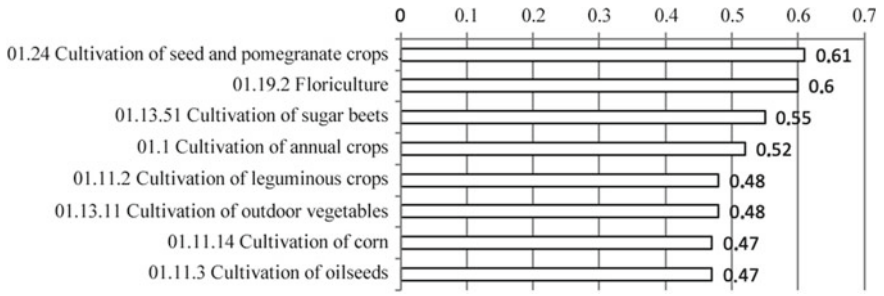

Fig. 3 The most profitable activities in crop production, revenue per ruble of assets, 2019. *Note* Revenue per ruble of assets was calculated as an average for 50 organizations leading in each type of activity. *Source* Compiled by the author based on statistical reports (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.).)

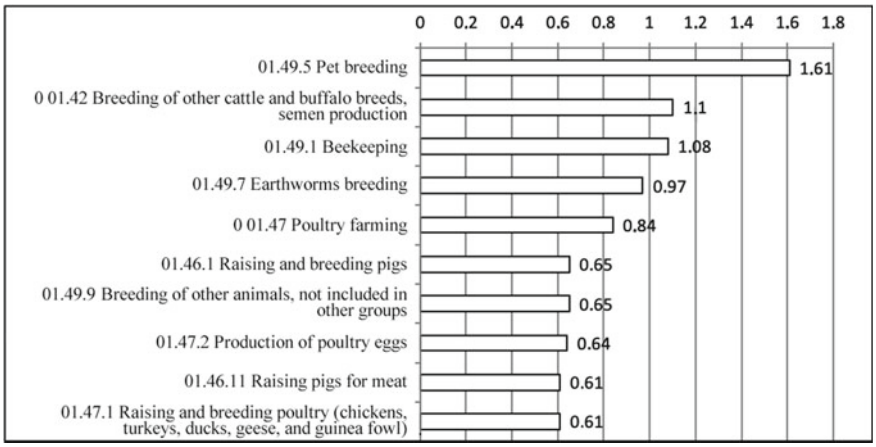

Fig. 4 The most profitable activities in animal husbandry, revenue per ruble of assets, 2019. *Note* Revenue per one ruble of assets was calculated as an average for 50 organizations leading in each type of activity. *Source* Compiled by the author based on statistical reports (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.).)

The least profitable activities in crop production are growing vegetables in protected areas (21 kopecks of revenue per one ruble of assets), growing other perennial crops (5 kopecks of revenue per one ruble of assets), and growing fibrous spinning crops (one kopeck of revenue per one ruble of assets).

The least profitable activities in livestock breeding are raising beef and other cattle (including buffalo, yaks, etc.) for meat (14 kopecks of revenue per one ruble of assets) and breeding domestic reindeer (12 kopecks per one ruble of assets).

It should be noted that multi-branch diversified organizations in activity type 01.5 "Mixed Agriculture" occupy 8.86% (2,380 units) of the total number. The profitability of such organizations was 37 kopecks of revenue per one ruble of assets. This group included large agricultural holdings such as JSC Firm *Agrocomplex* named after N. I. Tkachev, LLC *Bryansk Meat Company*, LLC *EkoNivaAgro*, and LLC *Central Chernozem Agroindustrial Company*.

4 Discussion

The ABC analysis presented in Table 1 can be used to assess the types of activities among agricultural organizations by prevalence and profitability.

We obtain the following subgroups of activities: AX—the most common activities with a high level of revenue per one ruble of assets; BX—common types of activities with a high level of revenue per one ruble of assets; CX—less common types of activity with a high level of revenue per one ruble of assets; AY—the most common activities with a medium level of revenue per one ruble of assets; AZ—the most

Table 1 ABC-analysis of agricultural production activities by profitability and prevalence

Revenue per one ruble of assets (profitability)				
		X (80%)	Y (15%)	Z (5%)
Number of organizations by type of activity (prevalence)	A (80%)	01.11.1 Crop cultivation 01.6 Auxiliary activities in crop production and post-harvest handling of agricultural products 01.61 Provision of services in the field of crop production 0 01.47 Poultry farming 0 01.49 Breeding of other animals 0 01.19 Cultivation of other annual crops	01.5 Mixed farming 0 01.13 Cultivation of vegetables, gourds, root and tuber crops, mushrooms, and truffles 01.13.1 Cultivation of vegetables 0 01.25 Cultivation of other fruit trees, shrubs, and nuts 01.21 Cultivation of grapes	
	B (15%)	0 01.46 Pig breeding 0 01.42 Breeding of other cattle and buffalo breeds, semen production 01.41.1 Dairy cattle breeding 01.30 Cultivation of seedlings 01.19.2 Floriculture 01.62 Provision of livestock services 01.24 Cultivation of seed and pomegranate crops 01.49.1 Beekeeping 01.11.11 Cultivation of wheat 01.11.3 Cultivation of oilseeds 01.41.11 Breeding of dairy cattle, except for pedigree cattle	01.25.1 Cultivation of other fruit and berry crops 01.43.1 Breeding of horses, donkeys, mules, and hinnies 01.49.4 Deer breeding 01.45.1 Sheep and goat breeding 01.42.1 Breeding of beef and other cattle, including buffalo, yaks, etc	01.19.1 Cultivation of annual forage crops 01.13.6 Cultivation of mushrooms and truffles 01.13.12 Cultivation of vegetables in protected areas

(continued)

Table 1 (continued)

Revenue per one ruble of assets (profitability)				
	C (5%)	01.13.51 Cultivation of sugar beets 01.47.1 Raising and breeding poultry (chickens, turkeys, ducks, geese, and guinea fowl) 01.46.1 Raising and breeding pigs 01.13.11 Cultivation of outdoor vegetables 01.49.9 Breeding of other animals not included in other groups 01.47.2 Production of poultry eggs 01.46.11 Raising pigs for meat 01.11.14 Cultivation of corn 01.23 Cultivation of citrus crops 01.49.5 Pet breeding 01.47.11 Raising poultry for meat 01.49.7 Earthworms breeding	01.49.2 Breeding of rabbits and other fur-bearing animals on farms 01.41.21 Production of raw cow milk 01.13.31 Cultivation of potato 01.22 Cultivation of tropical and subtropical crops	01.42.11 Raising of beef and other cattle, including buffalo, yaks, etc., for meat 01.16 Cultivation of fiber spinning crops 01.29 Cultivation of other perennial crops 01.42.12 Breeding of pedigree beef cattle and other cattle, including buffalo, yaks, etc 01.49.41 Breeding of domestic reindeer 01.64 Treating seeds for planting 01.19.21 Growing flowers in open and protected ground

Source Compiled by the authors based on statistical reports (Directory of Codes of the All-Russian Classifier of Economic Activities (OKVED).(n.d.))

common types of activities with a low level of revenue per one ruble of assets (no such activities); BY—common activities with a medium level of revenue per one ruble of assets; CY—less common activities with a medium level of revenue per one ruble of assets; BZ—common activities with a low level of revenue per one ruble of assets; CZ—less common activities with a low level of revenue per one ruble of assets.

The main promising activities include AX, BX, CX, and AY groups. Organizations with mixed (diversified) production are located in group AY.

Related activities are included in subgroups BY, CY, BZ. Activities of the group CZ are classified as problematic.

Let us note that the CZ group includes activities necessary for the country's economy—the cultivation of fibrous spinning crops, breeding of pedigree beef cattle and other cattle, including buffalo, yaks, etc., and breeding of domestic reindeer. It is advisable to provide state support to such types of activities and stimulate their development.

5 Conclusion

The analysis of the types of activities in agricultural production performed based on statistical reporting data of 26,850 organizations allowed us to distinguish the most and the least widespread in agriculture, as well as the most and the least profitable by revenue per 1 ruble of assets. Multi-branch diversified organizations occupy 8.86% of the total number of organizations; their profitability was 37 kopecks of revenue per one ruble of assets, which is lower than that of specialized organizations. According to the ABC-analysis results, they were categorized as AY group with high prevalence and average revenue per one ruble of assets. It is advisable to provide state support and stimulate the development of activities classified as CZ group due to the need for their products and the demand in the economy.

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The Case Experience and Territorial Features of Business Cooperation in Russia

Development of the Digital Economy in the Sphere of State and Municipal Administration in the Conditions of Innovative Technologies and Transformation of the National Economy

Natalya Y. Veselova, Naira P. Bichkova, Zhanna A. Aksenova, Olga V. Ishchenko, and Viktoria V. Salii

Abstract The purpose of the research is to study the degree of implementation of digitalization in the region and, on the basis of this, to propose recommendations for the innovative development of the digital economy taking into account the departmental project "Smart City," the President of Russia (President of Russia (2020)) addressed in his message. In this work, the author analyzed the significant factors of the development of the digital economy in Russia in the field of urban planning in the conditions of innovative technologies and the transformation of the national economy. Monitoring of the local community on this issue will make it possible to effectively implement the state and municipal administrations for the socio-economic development of the territory in the field of innovative digital technologies. The application of the digital economy in the field of urban planning of cities and territories will allow updating regulatory regulation, increasing productivity there, professionalism of personnel, improving the quality of education, forming research competencies and technical gaps, improving information infrastructure and information security. The transformation of the national economy using digitalization will create the basis for the formation of new markets and new conditions for the functioning of the market, as well as will allow the use of new innovative mechanisms at all levels of government in the field of digitalization of urban planning and socio-economic development of the territory.

Keywords Services · Information · Digital economy · Infrastructure · Urban development · Innovative technologies

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JEL Codes A110 · L96 · L97 · L98 · M15 · O12 · O32 · O35 · O310 · O380 · H700 · P10 · R190 · P17 · P25

1 Introduction

In the works of Dobrolyubova et al. (2019) it is noted that the use of the digital economy and its development is the tool that contributes to the development of urban planning, the improvement of infrastructure and the creation of comfortable conditions for citizens living in a particular territory through the introduction of promising innovative technologies.

The use of new digital technologies ensures effective state and municipal administration, contributes to the digitalization of various spheres of the economy, allows developing new relations on the basis of public and municipal-private partnerships, and expanding the cooperation of partnership contractual relations.

Currently in the world there are several dozens of smart and highly technological cities in which elements of a "smart city" are introduced. These cities are an international platform uniting "smart cities" and innovation centers in order to exchange experience on the management of sustainable development of a particular region, the subject of the Russian Federation. Moreover, eight cities of Russia such as Togliatti, Voronezh, Krasnodar, Sochi, Novorossiysk, Saratov, Magas (a city in southern Russia, the capital of the Republic of Ingushetia) and Innopolis (Republic of Tatarstan) are included in the category of "smart cities" and are rightfully considered high-tech cities. A striking example of an effectively developing entity is the nano-city of Sirius, where the technological infrastructure of the future is created and applied.

2 Methodology

The Smart City project was initiated by decree of the President of Russia (2018) (President of Russia 2018), (Ministry of Digital Development, Communications and Mass Communications of the Russian Federation (2020); Ministry of Digital Development, Communications and Mass Communications of the Russian Federation (2020)) is being implemented as part of the national projects Housing and Urban Environment and Digital Economy. The use of Internet services in many areas of life has great advantages:

a. minimum costs of digital services implementation;
b. wide possibility of placing and receiving any digital information;
c. availability of web page creation;
d. the possibility of making electronic payments in the present time, regardless of the territorial location of subscribers;

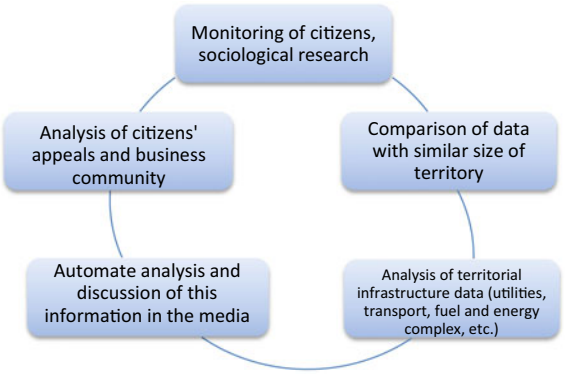

Fig. 1 Development of strategic directions and digital transformation. *Source* (Muravleva 2018), (Sidorenko et al. 2019)

e. equal access to the necessary information by any socio-economic entities, regardless of the territory of residence;
f. minimum time for receiving information from suppliers to the consumer;
g. simultaneous reach of the general public in informing about any areas of activity.

The Smart City project is aimed at increasing the competitiveness of Russian cities, urban planning and improvement, in the works of (Muravleva 2018; Sidorenko et al. 2019) it is noted that the formation of an effective urban management system, the creation of safe and comfortable conditions for the life of citizens and is based on 5 key principles:

h. human orientation;
i. technological effectiveness of urban infrastructure;
j. Improving the management of urban resources;
k. comfortable and safe environment;
l. improvement of service component of urban environment (Fig. 1).

Measures affecting the development of digitalization of the territory and its improvement include:

– Marketing activities aimed at promoting and improving the delivery of State and municipal services in electronic form;
– Implementation of the Unified Interdepartmental Electronic Document Management System;
– Training of State and municipal employees in the Unified Interdepartmental Electronic Document Management System;
– Migration of data on outstanding documents from previously used systems.

3 Results

One of the priority areas of Smart City is the development of infrastructure and transport system through the introduction of innovative digital technologies. When monitoring citizens, the Department of Information Policy of the Krasnodar Territory (2017) found that 72% of respondents own information about this project (Fig. 2).

Not more than 30% of respondents have information about what activities have already been carried out within the framework of innovative digital technologies. Nevertheless, more than 84% of respondents replied that the installation in cities and district centers of electronic signs, interactive touch panels, the development and launch of sites, interactive games, photo galleries of the territory of the municipality, urban district, etc., which contributes to the improvement of the territory and the quality of life. More than 74% of respondents noted that the placement on such devices of information about public transport routes, sightseeing, sports and concert programs and events help to navigate the information space faster, save time, create comfortable living conditions (Fig. 3).

For an objective assessment of the level of development of digitalization in the city, we turn to the data from the report by the Department of Information Policy of the Krasnodar Territory (2017) (Table 1).

This table shows the activity of using information networks by different actors. Based on the data given in the Department of Information Policy of the Krasnodar Territory (2017) (Table 2), we observe a logical situation—there are more Internet users among the young population than among the older generation.

It is also clear that business sector entities are using telecommunications more actively.

Table 2 also shows the results of observations on the level of online self-education of the population—the older generation is almost 5 times inferior in the number of youth students. From this, we can conclude that there is a large gap between generations in the field of knowledge and use of IT technologies.

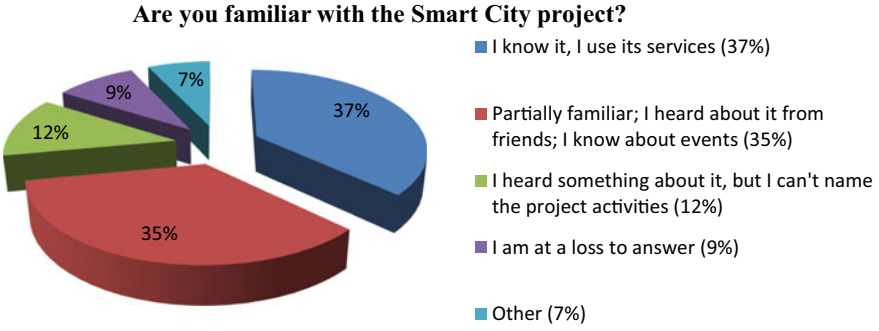

Fig. 2 The answer to the question: "Are you familiar with the Smart City project and the activities within the project?". *Source* (Department of Information Policy of the Krasnodar Territory (2017))

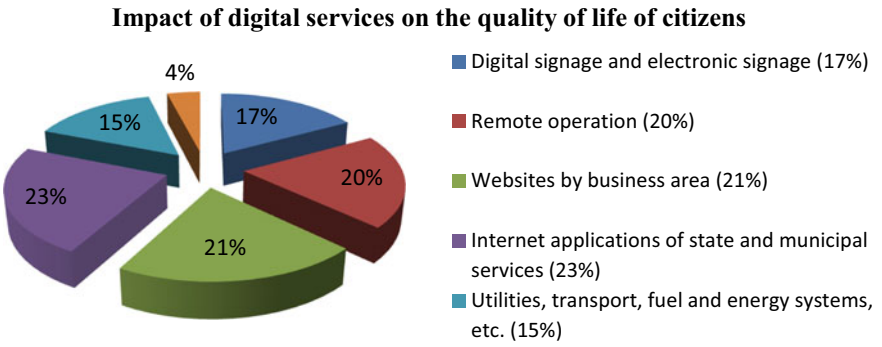

Fig. 3 Improving the quality of life with the development of digital technologies. *Source* (Department of Information Policy of the Krasnodar Territory (2017))

Table 1 Internet usage

Directions	Total citizens (%)	Youth (%)	Elderly generation (%)
Active internet users	88.3	98.7	64
Active social media users	65.9	83.0	32
	Population (%)		Organization (%)
Participants in electronic commerce	30.6		73.2
Participants in online interaction with authorities	84.4		75.4
	Organizations (%)	Business sector (%)	Social sphere (%)
Internet Information Technology Users	33.9	33.8	25.2

Source Department of Information Policy of the Krasnodar Territory (2017)

Table 2 Digital competencies

Directions	Total citizens (%)	Youth (%)	Elderly generation (%)
1	2	3	4
with digital skills	69.7	91.2	26.3
online self-education of the population	34.2	51.4	10.5
	Organizations (number)	Business sector (number)	Social sphere (number)
Enterprise ICT workers per 10,000 employees	173	187	116

Source Department of Information Policy of the Krasnodar Territory (2017)

Therefore, the use of the capabilities of the Internet network was in demand during the world pandemic. The situation during the developing crisis, restrictions on movement, quarantine, the need for self-isolation, has increased the need for Internet services from both the population and municipal authorities at times. Under the circumstances, it was necessary to expand the provision of services through the Internet.

Therefore, the most important side of the threat, namely, the infection of corona virus, is the timely informing of the population about actions during the pandemic. Interaction with healthcare institutions, receiving timely medical care, with minimal risks of infection for others, attracted citizens to use smart digital technologies in everyday life, showing their effectiveness, not replaceability in this situation and the prospect of further development throughout the country.

4 Conclusion

In such a way, as noted in the work of (Kosorukov 2017) and (Dobrolyubova et al. 2019) in order to effectively implement digital technologies aimed at improving the territory of the municipality within the framework of the Smart City project, it is necessary: monitoring to study the needs of citizens in digital technologies; software development; carrying out events aimed at popularization of this service.

As noted in his study by (Frolova and Shcherban 2019), within the framework of the Smart City project, you can get the following results: a comfortable and modern urban environment; a significant influx of guests into the territory of the region; further sustainable development of the city and surrounding settlements; improving comfort, aesthetics and quality of service; increasing the level of competitiveness of the territory where digitalization is introduced, etc.; safe online resources for voting, surveys of the population in various socio-economic spheres of life.

Based on the research and conclusions, we propose:

- to continue the development of digital technologies in the economy and in state and municipal administration in the Krasnodar Territory;
- to create digital trading platforms for intense price competition;
- to introduce digital technologies in various areas of economic activity of the region;
- to use best domestic and foreign digital transformation practices for their use in regional socio-economic policies;
- to train specialized personnel in the field of digitalization of the economy;
- to increase the effectiveness of interaction of all participants in the socio-economic development of the Territory;
- to use innovative digital economy projects.

Based on the above, it can be said that Russia today is a rather promising country in terms of the use of the digital economy in the conditions of innovative technologies and the transformation of the national economy.

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Natural Resource Management in the Context of Sustainable Development of Territories Within Special Economic Zones

Svetlana J. Starodumova and Liubov B. Sitdikova

Abstract The purpose of the research is to consider the peculiarities of different ways of managing natural resources, especially land (land plots), in the context of the sustainable development of territories within the special economic zones of Russia. The authors distinguish the management of natural resources depending on their form of ownership, giving special preference to the private form of ownership, as a direct way of managing natural resources in agricultural cooperation. The international experience of natural resources management has shown the dependence of urbanization and the quality of the state of ecology in specially designated territories and made it possible to identify areas for improving the management of natural resources in Russia. The digital transformation of natural resource management has been identified as a priority in the context of pandemic, but it does not exclude physical participation (control) in resource use. The need to implement a differentiated foreign policy on the management of natural resources in the border territories was identified, since the specificity of the mentality of the peoples integrating in these territories is based on exclusively consumer interest in access to the natural resources of such regions, the desire to use the transit potential of Russia, but not the desire to develop and preserve the border territorial space. In principle, research on natural resource management is carried out from the point of view of public administration, not taking into account the management of land, as the largest resource, by private owners, which has a decisive influence on the sustainable development of the territory. The results take into account the optimal management of natural resources using modern digital technologies and are aimed at the conservation and rational use of resources, especially in border areas located in special economic zones, which is especially important for maintaining the geopolitical integrity of the territory.

Keywords Natural resources · State exclusive ownership of natural resources · Agricultural cooperation · Sustainable development of territories · Sustainable management of resources · Special economic zones

JEL Code K320 · K33 · K110 · Q150 · Q230 · Q240 · Q280 · Q58 · R52 · H820

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1 Introduction

As the largest country on the planet, Russia also has the largest reserves of various natural resources, the rational management of which ensures not only the sustainable development of territories, according to Art. 2 of the Town-building Code of Russian Federation, but also guarantees political, economic and social stability both within the country and for its participation in modern global processes.

According to Recommendations 139 (2003) of the Congress of Local and Regional Authorities of the Council of Europe "On NGOs and Local and Regional Democracy", citizens can participate in the management of the development of the territories in which they live both directly voting in various public discussions of urban planning projects and co-operating with local authorities.

At the same time, projects for the development of border territories are often not of interest to investors due to the attitude towards Russia as a "raw material" country, which is a supplier, but not a producer of processed products (Andrichenko et al. 2018).

Unfortunately, this situation has developed due to outdated mechanisms for managing natural resources and the lack of special measures designed to support environmental entrepreneurship in Russia. In addition, legal regulation of land administration is not sufficiently developed in law theory.

At the same time, Western countries are actively introducing digitalization into management, for example, forestry, implementing the concept of Digital Forestry, which involves the creation of databases on remote sensing of forest areas (Sukhova and Abanina 2020).

As part of this work, it is planned to consider the features of the management of natural resources by private owners, without prejudice to the importance of public administration in special economic zones. From the analysis of international experience, it is planned to identify the characteristics of the impact of entrepreneurial activity on the state of natural resources.

2 Materials and Method

The scientific works of Andrichenko et al. (Andrichenko et al. 2018), Rayanov (Rayanov 2015) were studied in the study of issues of natural resources management in the context of sustainable development of territories within special economic zones. Special attention was paid to the study of the management of natural resources by private owners in the works of (Brinchuk 2011), (Rayanov 2015). Issues of rational use and management of natural resources are analyzed in the works of (Zhavoronkova and Shpakovsky 2019), (Sukhova and Abanina 2020). The foreign experience of land use and management of natural resources in the works of (Bürgi et al. 2017), (Nawaz et al. 2020), (Tasser et al. 2017). Foreign works emphasize the peculiarities of natural

resource management in special economic zones (Ahmed et al. 2020), (Nan et al. 2019), (Roy and Murthy 2009), (Villiers 2020).

Therefore, the studied materials made it possible to identify the practical problems of natural resource management existing not only in Russia, but also in foreign countries and formulate a mechanism for improving management in special economic zones, taking into account the development of the state of technology and science.

3 Results

Agricultural cooperation is the most important area of the implementation of state agrarian policy. Often, such cooperation is carried out in one of the four types of special economic zones enshrined in the Federal Law of 22.07.2005 N 116-FZ "On Special Economic Zones".

According to the authors, land use can also lead to massive changes in the concept of health of ecosystems located in special economic zones (Nan et al. 2019). However, most experts believe that location and land plot are the most important criteria in establishing special economic zones, taking into account environmental sustainability (Ahmed et al. 2020).

The stable socio-economic development of Russian cooperation is not possible without the rational use of natural resources, which, among other things, is a measure of nature conservation and a way of managing natural resources.

We believe that management is a function of complex organizational systems aimed at an internal organization, which, in relation to land management, is the activity of all state and municipal bodies based on a combination of persuasion and coercion methods, but without taking into account the direct management of private owners.

Unfortunately, the system of public management of natural resources is often haphazard, allowing a large number of different services, agencies and departments (each within its competence) to exercise powers to manage the same natural resources. At the same time, actual, effective management can be carried out only on the spot, by a specific object of law (natural resource).

Management is carried out by the owner of natural resources, which traditionally in relation to most resources, since Soviet times, has been the state (Rayanov 2015), but after the adoption of the Constitution of the Russian Federation, land (and for the purposes of cooperation—land plots in a particular category of land) and other natural resources are used and protected primarily as the basis for the life and activities of peoples living in the corresponding territory. At the same time, in addition to public management of land resources, domestic direct management is also developing—the management of private landowners.

It is of interest that land resources act as an object of regulation and an object of economic activity, and therefore the applied management methods will differ. Land management is also important to address the potential impacts of climate change.

At the same time, according to Art. 9 of the Constitution of the Russian Federation, land and other natural resources can be in both state and municipal and other forms of ownership, which introduces cooperatives into the circle of "managers" of natural resources.

However, in most cases, as Rayanov notes, there is a new problem related to the need for a clearer distinction between different forms of ownership between the subjects of management: the Russian Federation, the subjects of the Federation and private owners (Rayanov 2015). Representatives of environmental law, for example Brinchuk, speak of the need to declare nature the exclusive property of the state as a public domain (Brinchuk 2011), which excludes a private form of property.

We believe that the interests of civil society in general and cooperatives engaged in the direct use and management of natural resources in particular should be taken into account in the current conditions, which should not lead to restrictions on distributed forms of ownership of natural resources and facilities (Rayanov 2015), but should contribute to the implementation of responsible enterprise cooperation. It should be noted that cooperatives are an established form of entrepreneurship on land since Soviet times, which has an internal structure of a corporate legal entity. The corporate nature of the cooperative makes it possible to introduce natural resource management and foreign persons among the participants, although the legislation establishes certain restrictions on joining the agricultural cooperative and possessing the natural resources of foreign persons. However, corporate governance itself allows the involvement of foreigners, which for the most part makes the rules on restricting the participation of foreigners in the management of natural resources ineffective.

According to Sukhova and Abanina, the digital transformation of environmental management should be one of the main tasks in the field of legal provision of environmental safety and management of natural resources (Sukhova and Abanina 2020).

We believe that the electronic dissemination and dissemination to all participants in the management and use of natural resources of information on changes in their quantitative and qualitative condition will ensure not only the environmental security of the country, but also the rational use of natural resources in general.

At the same time, Zhavoronkova and Shpakovsky believe that the legal basis for digital transformations should be "not the perfection of technologies, but the formation of socio-environmental goals" (Zhavoronkova and Shpakovsky 2019). According to the Decree of the President of the Russian Federation dated December 31, 2015 N 6FZ "On the National Security Strategy of the Russian Federation," digital solutions should be introduced from the point of view of creating a model of lawful "environmental behavior" of subjects and eradicating "inefficient and" predatory "environmental use" in the process of carrying out any economic activity.

We believe that it is necessary to take into account the foreign experience of agricultural cooperation, which shows that intensive agricultural use affects all environmental processes, including after the cessation or reduction of the use of resources (Bürgi et al. 2017). This is especially true of the long, up to a hundred years, natural restoration of natural resources such as land and forests (Tasser et al. 2017).

In order to plan land use and formulate policies for the sustainable development of the territory in Russia, it is also advisable to develop scientific databases created using remote sensing and geospatial analysis of retrospective and promising scenarios using predictive and diagnostic methods (Roy and Murthy 2009). The resulting databases should form the basis for developing solutions for the effective management of natural resources as a connecting tool for the digital transformation of management. It is worth noting that positive trends in digital governance in Russia have been effectively introduced and developed since 2010, when the concept of "electronic" government was developed, which gradually led to the introduction of digitalization in urban management.

The authors also note that it is necessary to identify and provide farmers with special technologies for resource-saving agriculture for specific plots. Better agricultural land must be protected from encroachment by the city, and cooperation between scientists, farmers and politicians is needed to manage the soil to ensure food security (Nawaz et al. 2020).

No less interesting is De Villiers B. "s approach, which justifies that self-determination of peoples in a particular land territory can establish and ensure the development of self-government institutions, including through private corporations. Corporate governments from people would allow them to make decisions and directly manage reserves and other natural resources (Villiers 2020), thereby creating interesting cooperation on land.

4 Conclusion

The huge natural resource potential of Russia determines interest in international cooperation in relation to the consumption of natural resources, which obliges to develop new integration and legal links of natural resource management taking into account the interests of Russia itself.

However, legal and technological approaches to natural resource management still need to be improved. Digitalization of natural resource management is poorly developed at the legislative level. The design of management rules does not take into account the management of private owners, using the example of agricultural cooperatives, which have the right to own natural resources precisely on private property rights. Management of natural resources in special economic zones, especially in border territories, is not effective, since it is mainly focused on investment projects that are not interesting to potential foreign participants adjacent to these border territories.

Therefore, the identified problems allow further research into the features of natural resource management in Russia.

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Management of Regional Infrastructure Development: Network and Non-network Opportunities to Ensure the Sustainable Development of the Territory's Economy

Andrey A. Bukchtayarov, Nadezhda A. Ovcharenko, Taisiya N. Sidorenko, Victoria Yu. Pavlovskaya, and Natalia V. Poluyanova

Abstract The scientific article presents the results of the author's scientific search in terms of assessing the potential for sustainable development of the economies of modern regions based on infrastructure network and non-network scenarios aimed at maximum complete release and cost-effective use of the resource potential of territories. The methodological basis of the research was the work of researchers in the development and modernization of the methodology for the study of regional markets and regional market infrastructure (A. S. Novoselov, A. N. Simonov, S. M. Khalilova), research on specific regional markets (O. I. Arlanova, A. V. Zverev, E. Yevtushenko and I. Rabinovich, A. D. Erok, S. R. Natkho, D. V. Rozhkova, A. A. Solkina), directly focused infrastructure studies aimed at analysing and assessing the characteristics and national economic significance of certain types of regional market infrastructure Zvereva (2015), Kokoshko (2010), Novoselov and Volyanskaya (2015), Fetisova and Chigareva (2015). The development of regional market infrastructure is currently an area of impulse and fragmentary research, emphasizing the need to implement infrastructure scenarios for the development of regional economies, but, as a rule, limited to trying to identify problems of the economy and management associated with overcoming infrastructure deficits. The more comprehensive realization of the possibilities of network and non-network economic development of subjects of regional socio-economic systems based on modernization of regional market infrastructure is a promising direction of the strategy of sustainable development of territories, providing a systematic approach to solving key spatial socio-economic problems taking into account the importance of sustainable development as a paradigm of the modern regional economy. Novelty of implemented research consists in synthesis of existing approaches to understanding essence, peculiarities and prospects of network and non-network development of regional market infrastructure.

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Keywords Regional economy · Regional infrastructure · Regional market infrastructure · Sustainable development

JEL Code R10 · R11 · R23

1 Introduction

The regional market infrastructure is currently characterized by a systematic modernization of infrastructure capacities and a qualitative change in the structure of trade in the direction of modern formats for organizing market activities. At the same time, in the context of crisis economic phenomena, the infrastructure capabilities of traditional markets remain significant infrastructure reserves to support the sustainability of local and regional socio-economic processes.

2 Methods and Materials

The problems of the formation, functioning and development of regional market infrastructure in modern Russian research activities can be structured into three main areas:

- development and modernization of methodology for research of regional markets and regional market infrastructure (Novoselov 2008; Simonov 2015.; Khalilova 2011);
- studies of specific regional markets (Arlanova 2008; Yevtushenko and Rabinovich 2014; Erok 2019; Zverev 2011; Natkho 2018; Rozhkova 2015; Solkina 2018);
- directly infrastructure research aimed at analysing and assessing the peculiarities and national economic significance of certain types of regional market infrastructure (Zvereva 2015; Kokoshko 2010; Novoselov and Volyanskaya 2015; Fetisova and Chigareva 2015).

3 Results

The main problems of the formation and development of market infrastructure in the Russian regions, according to A.S. Novoselov, include:

- simultaneous and spontaneous transformation of the regional market infrastructure in the absence of plans and strategies for its formation and effectiveness assessment;
- significant regional differentiation in the pace, composition and functionality of established regional infrastructure market systems (Novoselov 2008).

Among the promising areas for the development of regional infrastructure of a particular market A.S. Novoselov included:

- increasing the capital base and technical equipment of trade, transport and logistics organizations—subjects of the regional economy;
- increasing the effectiveness of interaction with the prospect of partnership and integration with entities of the financial and credit sphere of the regional economy (Novoselov 2008).

Emphasizing the fundamental nature of the author's approach, we note that it does not define the regional market infrastructure itself, does not give its classification and main functions, does not pay attention to specific economic effects, including national economic ones, from the creation, functioning and development of market infrastructure hubs.

A. N. Simonov, generally agreeing with the conceptual approach of A. S. Novoselova, noted that the main factor in the formation of regional markets for specific economic benefits is the specificity of the regional reproductive process, which affects the entire sphere of regional trade and covers all regional economic entities represented within a specific territory without exception (Simonov 2015.).

S. M. Khalilova attempted to review the methodology for the study of regional markets and regional market infrastructure from the perspective of conceptual approaches to centralized regulation of regional market processes, highlighting and noting the following significant patterns:

- Keynesian theory and Keynesian-Neoclassical synthesis are oriented towards the application of budgetary tools to stimulate demand, the development of local competition processes and pricing management;
- Monetarism, as the main priorities for stimulating regional market activity, is focused on freedom of enterprise, regulation of the volume of money supply and the availability of financial resources for market entities, and saving social unproductive costs (Khalilova 2011).

Having agreed with the promising directions of the research methodology for the market infrastructure of regional economic systems, we emphasize the need to detail and refine it in order to distinguish infrastructure and structural scenarios of the evolution of regional market-reproduction processes, the reliable definition and classification of the subjects of these processes and their national economic significance in relation to the results of the functioning of the economy of the content territory.

Note that in fact, the issue of regional market infrastructure has not been disclosed by the author, although the author's classification of transactions within the local/regional market can be positively evaluated in terms of reliable allocation of specific types of transactions that form independent flows of goods and material assets that should be mediated by specific subjects of regional market infrastructure (the role of which the author is largely not disclosed and underestimated).

A similar drawback is the approach of S.R. Natkho, who defined the development of regional market infrastructure as the priority of regional regulatory policy, but

identified in the dissertation work the regional market infrastructure with "the system of state administration measures of target markets" (Natkho 2018).

In our opinion, such identification of qualitatively heterogeneous categories of regional economy requires additional and very detailed justification, apparently, the author was not able to distinguish between the terms "regional market infrastructure" and "institutions of regional markets."

Studies focused on the analysis and assessment of the peculiarities and national economic significance of certain types of regional market infrastructure are presented by I. V. Zvereva, L. V. Konoshko, A. S. Novoselov and T. V. Volyanskaya, O. V. Fetisova and T. V. Chigareva.

I. V. Zvereva, in an attempt to define a regional market infrastructure, tried to characterize it by identifying a set of entities—organizations specializing in various types of services and focused on ensuring the functionality of specific regional markets (consumer, products and services for industrial and technical purposes, labor, financial resources and capital, information). The author axiomatically suggests the need for advanced infrastructure development, which, in her opinion, determines "the stability and flexibility of the regional economy as a whole, as well as the success of its development" (Zvereva 2015).

The author's conclusions and assessments are not supported by the results of empirical studies, they are largely debatable, especially in terms of the thesis about infrastructure as an independent regional "point" of growth. The experience of the implementation of the latest local/regional infrastructure projects (for example, the construction of new metro lines in New Moscow) indicates the delayed multiplier effect of the formation of a full-fledged infrastructure support, which can ensure the development of the location as a whole, but significantly reduce the effectiveness of infrastructure enterprises and organizations in the absence of direct users of the relevant services and their demand.

In the definition of L. V. Kokoshko, the main function of market infrastructure is to promote the mobility of all types of economic resources as the basis of the modern global economic process, focused on the formation and use of the most efficient production functions (Kokoshko 2010), p. 30. The author considers the key functions performed by market infrastructure entities to be:

- integration of economic actors (including regional ones) and intermediation of relations between them;
- the possibility of regulating the proportion and pace of economic development by stimulating/restricting/banning the development of targeted infrastructure (Kokoshko 2010), p. 32.

According to the author's classification of types of market infrastructure L.V. Kokoshko, it is possible to use the following characteristics of its differentiation:

- a functional feature determined by the content, quality and orientation of the economic processes being mediated;
- a sign of the form of ownership;
- a sign of innovation (Kokoshko 2010), p. 35–37.

It should be emphasized that as a specific identification feature that allows to identify and characterize the segment of regional market infrastructure, the author notes the sign of the provision of infrastructure services of all types to corporate consumers (Kokoshko 2010), p. 38, proposing on this basis to distinguish between social and market infrastructure (it turns out that the population of the territory can only act as subjects—recipients of social markets, not being full-fledged subjects of market relations, which is extremely debatable and very, in our opinion, not justified).

Criticism of the author's approach is as follows:

- the author identifies the existence of a market infrastructure with the existence of regional markets, although market relations are possible in an infrastructure-free form, based on direct economic and economic ties;
- the delegation of infrastructure functions to provide regional economic processes to specialized suppliers can significantly change the quality of the regional competitive environment and the intensity of competitive processes, ranging from natural/predatory competition to monopoly, with the full range of both favourable and negative economic and social effects.

Having agreed with almost all points of the approach, we note that a number of infrastructure subsystems of market functionality, for example, the financial and credit subsystem currently does not have regional subordination, but is effectively directed and administered from the national level of national economic management.

At the same time, the approach considered is a full conceptual basis for the development of a highly necessary and current strategic planning document, the Regional Infrastructure Development Strategy, development and sequential implementation of which can synchronize the development vectors of various levels of regional economic systems, To involve in their composition new prospective participants with economic potential and interested in its commercialization within specific regions, Ensure transparent and consistent dynamics in the implementation of the priorities of the long-term strategic development of the targeted territories.

O. V. Fetisova and T. V. Chigareva, when studying the problems of formation and regularities of functioning of regional consumer markets, point to the possibility of forming both direct relationships between market entities (sellers and end consumers) and the possibility of complicating these relationships and including infrastructure service providers in market processes (Fetisova and Chigareva 2015).

4 Conclusion

Therefore, to sum things up, we will once again emphasize the relevance of further studies of regional market infrastructure as a "point," or rather a space of economic

development that can qualitatively increase the effectiveness of regional socio-economic systems. Approaches to the study of network and non-network infrastructure market entities capable of ensuring the systematic and sustainable implementation of infrastructure functions in spatially localized economic systems of modern Russian regions require further development.

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Environmental Aspects of the Industrial Policy of Modern Municipalities

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Abstract Ecology has moved from the category of scientific and speculative problems to the list of the most urgent, and affecting almost all people on the planet. The unresolved nature of environmental problems is becoming global, affecting all inhabitants of our planet without exception, influencing social policies, slowing down economic growth, and in some cases leading to political conflicts. Cities play a key role in the progress of our civilization, while contributing to major changes in the environment. In most cases, these changes are negative, affecting first the ecological balance and then all of humanity. The article considers the influence of the industrial industry on the ecology of municipalities as part of their economic development strategy. A number of contradictions have been identified between the industrial policies in municipalities necessary to meet the growing needs of citizens and the preservation of biocoenosis. Further neglect of these problems inevitably threatens a sharp drop in the pace of socio-economic development of municipalities, while at the same time increasing numerous threats to residents of urban settlements. The authors of the article formulated proposals to minimize the damage caused by industrial enterprises, while maintaining the vector for industrial and post-industrial development.

Keywords Cities · Ecology · Megacities · Industrial production · Education · Health · Technology

JEL Code O13

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1 Introduction

Production is multifaceted and comprehensive: there are industrial enterprises created in the nineteenth century and even earlier, and there is a modern production that uses the most advanced technologies, including digital ones, and even those that do not need human participation. All of them are united by a common property, from the point of view of this work: in one way or another they have an impact on the environment and, in most cases, this impact is negative. In large cities, industry plays an important role in shaping the climate and other natural conditions for residents. The processes taking place in the world economy and the combination of local factors (increased wages for workers, rising prices for land in large cities, periodic crises of overproduction, as well as technological innovations) led to the closure or redeployment of many industries.

The purpose of this work is to analyze the impact of the industrial sphere of the urban economy on the environmental component of the life of citizens and the municipality as a whole.

As a hypothesis, the following provisions are put forward:

1. The relationship between human activity and wildlife must be taken into account. Sometimes such an impact is even relatively positive, and nature gets the opportunity to restore the previously disturbed balance, but much more often this turns into losses for all living things.
2. The main thing in the interaction of production and nature is, in our opinion, that this process is social in nature: in one way or another, people are involved in it (either as performers or as decision makers).
3. Various factors play an important role in the environmental component of production: the structure and cultural characteristics of a given society, the specifics of national legislation, even the methods of decision-making - democratic or not.

2 Materials and Methods

The work used general scientific methods of cognition:

- induction: based on the generalization of trends in the development of technologies, the world economy, the conclusion is made about the integrated impact of industrial production on the socio-economic sphere of municipalities,
- deduction: a hypothesis has been formulated on the social nature of the interaction of man and natural complexes in the process of implementing industrial policy,
- statistical analysis: comparison and synthesis of statistics for different cities on environmental change.

The literature review showed a high degree of knowledge of the problem posed, which was touched upon in the works of (Kruglov 2017), (Mirgaleeva et al. 2016), (Manturov 2017) and (Pakhomova and Malyshkov 2017).

The authors also used the materials from The globalization and environmental policy of Russia (Student Scientific Society of Federal State Budgetary Educational Institution of Further Professional Education "BGITA." 2015) in this article.

3 Results

The analysis of industrial development and its impact on urban ecology and nearby territories demonstrates certain contradictions common to most such projects. These contradictions relate to the following interconnections and relationships:

a. between the number of operating enterprises and the amounts of pollution generated by them. As a rule, there is a direct dependence: the more enterprises, the more and the scale of pollution. Given the fact that modern environmental law requirements are very stringent and construction technologies are developing, in some cases a modern large enterprise producing much more products than a similar organization, but using obsolete equipment, generates less waste. However, in most cases, an increase in the number of production plants also means an increase in waste and garbage;
b. between production and resource consumption. Resource-saving technologies have been developing for more than a decade; some types of raw materials have been replaced by others (for example, synthetic materials instead of natural ones are actively used in clothing production), but the dependence remains the same: products are produced from resources and the higher the production volumes of the former, the higher the consumption of the latter;
c. the third contradiction is the correlation between the number of industrial personnel and the amount of waste;
d. the fourth contradiction concerns the level of environmental consciousness of enterprise managers and employees. The lower the level, the greater the damage to the environment. It is impossible to resolve this contradiction without a multi-stage system of continuing education, from kindergarten to the age of pensioners, as well as a certain level of environmental education and intellectual development of the whole society, which either negatively relates to garbage, dirt, or positively to the preservation of biological representatives, or, on the contrary, ignores the problems of nature, believing that its protection is not a matter for everyone. At the same time, the principle of the functioning of the environmental education system is quite understandable for anyone: it is easier to avoid the occurrence of garbage, waste, than then combat the consequences of their appearance;
e. the fifth direction concerns the level of development and introduction of the used technologies at the enterprise and the corresponding level of energy impact on the environment, on the health of citizens. We are talking not only about such well-studied options as electromagnetic, thermal, radiation and some other types of effects, but also, for example, about the vibration noise effect on biological

creatures. Some negative effects manifest themselves only after a long period of time (for example, a decrease in the size of animals as a result of climatic changes—an increase in air temperature), and technology has already been massively introduced into the economy and life of cities, therefore, it becomes difficult to change anything.

4 Discussion

On the one hand, modern industrial production is the result of the long progress of technology, as well as the ever-increasing demand for goods and services of an increasing population. On the other hand, mass production also acts as the main consumer of natural resources, many of which are exhausted, and as a source of pollution. Moreover, technological progress itself and the availability of new technologies does not mean the absence or minimization of damage to nature. Considering the relationship between these two processes—the continuous development of industrial production and the deterioration of the environmental situation in the world—a number of developed dilemmas can be identified (Makarova et al. 2019).

Firstly, it is not enough to simply stop industrial production. It is common for parties or social organizations (e.g. Greenpeace) to make such demands. However, in the event of the suspension or complete termination of a particular enterprise, a positive environmental effect is observed only in the short term (then, as noted above, no less acute problems may arise), and for a limited territory, but not for humanity as a whole. If we consider the option not to close production, but to transfer it to another region, then we can state a certain duality of the position of environmental activists: the struggle for cleanliness and conservation of nature is carried out only for their own citizens, who, by the way, are voters, and what will happen to residents of cities of other countries is not taken into account.

The second approach is to reflect another extreme—the denial of any problems with the environment in general and the development of production regardless of polluting factors. The second direction, unlike the first, just found its practical embodiment and we can give many examples in the cities of Africa, Asia, and, unfortunately, in Russia, when production caused such large-scale damage to both the environment and the health of citizens, which raised the question of the very possibility of living in this territory. Despite the obvious negative consequences, in this case there is a simple rule: as long as this production is profitable (it brings profit to owners, tax revenues and goods to the state and society, jobs for citizens), then the protests of conservationists can be ignored. If humanity wants to persist in the future, choosing the second option for the development of production technologies means an inevitable disaster.

The third direction is a compromise between the two above and consists in the functioning of industrial enterprises producing much-needed products for citizens and residents of rural areas, while maintaining environmental safety at a level that would leave nature with the opportunity for restoration. This is very difficult to

achieve in reality, and in the world you can find few examples of the truly successful functioning of large industries while preserving the natural environment. Modern technologies, albeit minimally, affect nature, so the real task is to find such construction options in which the new industrial facility will not cause irreparable damage to the environment, and natural complexes will have the opportunity to launch a mechanism of self-reproduction and restoration (Uryadnikova 2012). It is also necessary to take into account the size of the city where the industrial enterprise is located, and the interests of local residents. Together, this makes the task of environmental support for the construction of industrial enterprises non-trivial and difficult, but there is no other way at the current stage of the development of scientific and technological progress.

In the center of the structural pyramid of industry there are numerous branches of mechanical engineering (automotive, aviation, shipbuilding, etc.), metalworking, energy equipment, where raw materials received from the mining and processing industries are further converted into a finished product in the process of technological algorithms (Skobelev 2019). Despite advances in technology, products are not becoming more reliable, but increasingly disposable: these are the requirements of expanded reproduction. If we add to this the long-standing policy of financial stimulus of sales through low interest rates (especially in developed countries), then the policy of constant renewal, sometimes of no meaning, but in every way supported by manufacturers, does not surprise anyone. A system of rotary consumption has been formed, which in the future, combined with functional redundancy (many qualities of modern technology are not needed by the consumer), can lead to the onset of economic singularity (Vakhitov 2019). For nature, the above means exhausting resources, increasing waste and increasing the overall negative environmental effect.

High-tech (at the moment) industries that are at the top of the pyramid also bear at their core unresolved environmental problems, which do not immediately manifest themselves and are latent in nature. The most modern enterprises are being built using advanced construction and, among other things, environmental technologies. Enterprises of the microelectronic or biotechnological industry are favorably different externally, for example, from a metallurgical concern or a mining and processing plant: there are no pipes that emit tons of smog and gases, production buildings are small and surrounded by green spaces, the areas occupied by companies of the new formation are much smaller compared to old industrial giants. The amount of resources directly used by high-tech enterprises, at first glance, is also less, but this requires a comprehensive approach when considering. In terms of impact on nature, modern high-tech production leaves the same, if not greater, ecological footprint as enterprises in the extractive and manufacturing industries.

5 Conclusion

Since the rejection of industry is not on the agenda of human development, it means that it is necessary to combine somehow the modern standard of living, based on

a complex of technologies, with the preservation of the natural environment as an obligatory condition for the existence of our civilization (Kirillova et al. 2019). It should be noted that such questions were previously asked by country leaders, so at this point in time there has been some experience, if not a complete compromise, then, in any case, minimizing damage to nature. In our opinion, two approaches can be specified in the fight against the negative effects of industrial production.

The first is the process of waste and pollution management at the final stage of production. The result of this approach is the transfer of waste from one environment to another (from air to soil) or, as noted above, between territories and countries.

The second approach is the application of a closed cycle of production, which environmental scientists talked about half a century ago. However, the current level of technology development does not allow to ensure 100% processing of raw materials, some part still enters the environment. In addition, it is necessary to take into account not only emissions of gases and metals into the urban environment, but also indirect damage (noise, light) for residents of municipalities. In this regard, the mass-scale closed industrial production system remains an unattainable objective at this time (Nabieva 2018). In practice, three components of the second approach are actively applied: resource savings; extension of useful life of products produced at the enterprise; increasing the level of recovery of useful elements from natural raw materials (an example is oil, from which over more than 100 years of industrial production and processing have learned to extradite almost 100% of chemical elements and products that are used in various areas of life) (Ovchinnikova and Ashikhmina 2013). In addition to the two approaches mentioned, a number of activities are identified that are easy to implement in any industrial enterprise and thereby minimize environmental damage:

- keeping the equipment in proper condition;
- limit or eliminate emissions from an industrial enterprise if possible. In order to do this, you need to analyze all stages of the technological process in order to identify exactly where and in what way the types of waste go to the natural environment;
- organization of an ongoing emission monitoring system. It concerns the company's own control service (there are also state control services), designed to record various types of leaks and carry out their timely elimination;
- the formation of a culture of environmental behavior at the workplace, which means the creation of a system of training, the organization of educational projects for employees and managers of the enterprise.

The functioning of cities in its current form is impossible without industrial production, but nature does not have reserves to withstand the modern level of industrialization, which, moreover, is constantly increasing, following the growing trend in demand for goods and services. In order to survive, natural complexes will change, but places for humans may not be found in them.

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Theoretical Aspects of Regional Sustainable Development in the EU and Russia

Nadezhda K. Kozar, Alexander N. Kozar, Roza M. Davletbaeva, and Albina D. Khayaleeva

Abstract Effective use of the potential of both the individual country and its regions for sustainable development is possible only through informed, focused and evidence-based action to transform regional systems. That is why the purpose of this article is to analyze the theoretical aspects of regional sustainable development in the EU and Russia, which will create a methodological basis for the further development of practical mechanisms for ensuring balanced regional development. As the main method of research, we use critical analysis and comparison of normative documents, analytical reports, regional development strategies and scientific publications on sustainable development. As a result, the authors substantiate the essence of sustainable development and clarify the concept of regional sustainable development. This made it possible to determine its features. The authors distinguish vectors for ensuring the sustainable regional development of Russia. However, for the effective implementation of certain strategic priorities, a change in public consciousness is necessary in order to understand the importance of regional sustainable development, as well as the definition of clear criteria for achieving sustainable development and the constant monitoring of its level. We consider education as one of the most effective tools that will allow us to form a system of knowledge, skills and competencies necessary to form citizens responsible for the future of the country.

Keywords Sustainable development · Regional sustainable development · European union (EU) · Sustainable development strategy · Social responsibility

JEL Codes R10 · R11

1 Introduction

Regional development is shaped by the country's socio-economic trends, the availability of human capital, the level and quality of life of the population, and the ability

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to manage and reproduce natural resources. At the same time, the imbalance of development both within individual regions and imbalances in the level of development of different regions can disrupt national security. That is why not only the sustainable development of the country but also the sustainable development of its regions is important. Since the adopted Global Sustainable Development Goals (reflect only existing global challenges and priorities, they can be achieved through international and multilateral cooperation. At the same time, the development of national strategies is only an outline of the country's development priorities. The actual achievement of these priorities takes place at the local level (Likhonosova et al. 2018), based on the individual capacities of each region. This is also worth recalling that the policy of equalization of regional development adopted by the EU (An introduction to EU Cohesion Policy) is ambiguous in countries with different rates of economic development. The concept of national selfishness is gaining popularity (Dénes 2012). This makes it difficult to achieve the global Sustainable Development Goals, but gives impetus to the development of regions, which in the future will lead to the sustainable development of countries and their associations.

Systemic management of sustainable development is of great theoretical and practical importance, since the effective use of the potential of both the individual country and its regions for sustainable development is possible only on the basis of conscious, focused, scientifically sound actions to transform regional systems. That is why the purpose of this article is to analyze the theoretical aspects of regional sustainable development in the EU and Russia, which will create a methodological basis for the further development of practical mechanisms for ensuring balanced regional development. Realization of the set goal requires the following tasks:

- Substantiation of the essence of sustainable development, clarification of the concept of regional sustainable development (this will determine its characteristics);
- Synthesis of institutional principles for sustainable regional development;
- Identification of vectors for sustainable regional development.

2 Materials and Methods

As the main method of research, we use critical analysis and comparison of normative documents, analytical reports, regional development strategies and scientific publications on sustainable development.

We believe that the assessment of the level of representation of the term "regional sustainable development" in comparison with the term "sustainable development" in the usual search results of Google, Google Scholar and the Web of Science Core Collection indicates that the level of development of the scientific base is insufficient, especially in Russia. Therefore, we propose to focus on the definition of regional sustainable development, its main aspects and the peculiarities of security in the EU and Russia.

Consider how the terms “sustainable development” and “regional sustainable development” are mapped in the usual Google, Google Scholar and Web of Science Core Collection search results.

1. "Sustainable development”:

   - Google: in Russian—within 0.44 s 15.4 million results; in English—within 0.55 s 423 million results
   - Google Scholar: in Russian—within 0.09 s 61.7 million results; in English—within 0.07 s 3230 million results
   - Web of Science Core Collection: not in Russian; in English—100.8 million results.

2. "Regional sustainable development”:

   - Google: in Russian—within 0.49 s 5.1 million results; in English—within 0.53 s 235 million results
   - Google Scholar: in Russian—within 0.11 s 28 million results; in English—within 0.09 s 2520 million results
   - Web of Science Core Collection: not in Russian; in English—8.6 million results.

Given these data, we propose to focus on the definition of regional sustainable development, its main aspects and the peculiarities of security in the EU and Russia.

In order to achieve the goals, the following general scientific and specialized methods were used:

- theoretical synthesis, comparison and systematization—study of the essence and features of sustainable development of the region;
- systematic analysis to determine the institutional framework for sustainable development in the region;
- abstract-logical—for theoretical generalization and conclusion;
- graphical method-for visualization of features and vectors of sustainable development of the region, etc.

3 Results

3.1 The Essence and Characteristics of Regional Sustainable Development

Sustainable development is a long-term process of transformation taking place in the economic, social and environmental spheres. It is compounded by changes in citizens' minds and increased social responsibility. At the same time, sustainable development can lead to positive quantitative changes (growth in employment, investment, income, etc.) and qualitative changes (changes in social organization, technological progress).

Importantly, an understanding of the need for sustainable development has emerged from a number of imbalances and global challenges. Thus, the modern world is overpopulated. According to the UN, by 2050, 9.8 billion people will live in the world (United Nations Department of Economic and Social Affairs, World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100.URL:https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html (Data accessed: 10.12.2020) 2050). There is significant interference with the natural environment and uncontrolled consumption of natural resources. According to the Food and Agriculture Organization of the United Nations, about 7.3 million hectares of forest are destroyed each year (https://www.fao.org.home.en) Poverty and regional disparities in development are increasing. So, according to the UN Food and Agriculture Organization, this is about 815 million people out of 7.6 billion people in the world (which is 10.7% of the total). At the same time, the vast majority of people suffering from hunger live in low- and middle-income countries (UN World Food Programme. URL: https://www.wfp.org/ (Data accessed:10.12.2020)). These and other global challenges are driving humankind to think about what decisions should be made and which vector of development to choose. The term "sustainable development" has been the subject of scientific debate in many countries.

From our point of view, sustainable development can be defined as a form of interaction that balances the interests of all stakeholders and ensures the survival of future generations. Thus, ensuring sustainable development is not only a legal problem (the development of a regulatory framework), not only a technical problem (the invention of technical possibilities for the optimal use of available resources), not only a scientific problem (the development of theories and concepts). Achieving sustainable development requires, above all, a change of consciousness on an ethical basis, which will promote cooperation and mutual understanding. The basic principles of sustainable development are the preservation of the integrity of ecosystems, the preservation of natural resources while developing society, the achievement of equality, social justice, cultural diversity and self-determination, and the optimal satisfaction of basic human needs.

Accordingly, regional sustainable development is a dynamic process that can preserve and accumulate the potential of the region, increase its long-term competitiveness, and balance the indicators of development of the region. This is achieved by identifying and following development priorities in the environmental, social and economic spheres, effectively managing the resource base of the region, ensuring social justice and social responsibility, harmonizing the interests of all stakeholders, etc.

The sustainable development of the region is influenced by numerous interrelated social, economic, spatial and other factors of an internal and external nature. That is why in order to implement the model of regional sustainable development in Russia, it is necessary to prepare and justify strategic decisions taking into account European experience.

3.2 Identification of Vectors for Ensuring Sustainable Development of the Region in Russia

Further integration into the European community requires the development and implementation of effective mechanisms for interaction between the state, business and communities. According to experts, cooperation is rapidly becoming a key factor in the success of activities in the modern world (Cygler et al. 2018). Given the European experience of using the concept of social responsibility for the balanced development of regions, the main priorities are responsible production, responsible investment and responsible consumption.

The modern economy is characterized by intense changes and high risk (Trunina et al. 2018, p. 530). Therefore, one of the main prerequisites for the sustainable development of the region is the consideration of strategic priorities for both the individual and society. Education is an effective tool for achieving sustainable development in the region. Thus, according to the UNESCO Global Education Agenda 2030, education contributes to the development of key citizen competencies for sustainable development. In our view, one of the most important competencies is critical thinking (Vartanova, p. 99), (Trunina 2015, p. 212). This is important, since in modern conditions the use of artificial intelligence technologies for decision-making is becoming more and more urgent (Buzko et al. 2016, p. 28).

Therefore, the process of changing teaching methods and providing courses with information on the sustainable development of regions, both in higher education institutions and in secondary and primary education institutions, is important. This will make it possible to create a system of knowledge, skills and competencies necessary for the formation of citizens responsible for the future of the country.

4 Conclusion

The scientific research has led to the following conclusions:

1. Sustainable development is a long-term transformation process that can lead to positive quantitative changes (growth in employment, investment, income, etc.) and qualitative changes (changes in social organization, scientific and technological progress). In our view, sustainable development can be defined as a form of interaction that balances the interests of all stakeholders and ensures the survival of future generations. Therefore, ensuring sustainable development is not only a legal problem (the development of a regulatory framework), not only a technical problem (the invention of technical possibilities for the optimal use of available resources) and not only a scientific problem (the development of theories and concepts). Achieving sustainable development requires, above all, a change of consciousness based on ethical principles, which will promote cooperation and mutual understanding.

2. Sustainable development of the region is a dynamic process that allows to preserve and accumulate the potential of the region, increase its long-term competitiveness, and balance the indicators of development of the region. This is achieved by identifying and observing development priorities in the environmental, social and economic spheres, effectively managing the resource base of the region, ensuring social justice and social responsibility, harmonizing the interests of all stakeholders, etc.
3. In recent years, many regions of Russia, determining the priorities of regional policy, have chosen regional sustainable development as an instrument for effective territorial management. However, most often the definition of priorities for sustainable development of the region is declarative, they are not supported by scientific justification and methodological development of regional policies.

However, effective implementation of certain strategic priorities requires a change in public consciousness in order to understand the importance of regional sustainable development, as well as the definition of clear criteria for achieving sustainable development and constant monitoring of its level. We consider education as one of the most effective tools that will allow us to form a system of knowledge, skills and competencies necessary to form citizens responsible for the future of the country.

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Infrastructure Type of Regional Economic Development as the Basis for the Stability of the Territory's Economy: Modern Scientific Landscape, Features of Initiation, Management and Promotion

Alexander A. Voronov, Veronika E. Garkovenko, Victoria Yu. Pavlovskya, Sergei A. Morusov, and Natalia V. Poluyanova

Abstract The scientific article is devoted to consideration of peculiarities of theoretical and methodological substantiation of processes of controlled infrastructure socio-economic development, as well as key aspects of initiation and promotion of infrastructure type of modernization of regional economic systems. The methodological basis of the research consists of works of A.G. Granberg, A.S. Novoselov, the works of V. V. Bukreev, A. Zh Bulikeeva, B. A. Delenyan, I. V. Zvereva, A. V. Kaplina, A. S. Marshallova and G. D. Kovalyova, M. G. G. Currently, the infrastructure type of regional economic development is a promising methodology of economics and management, focused on systemic modernization and improving the effectiveness of regional economic systems. However, its application requires a significant modernization of economic and management approaches in terms of setting and implementing applied infrastructure tasks at the regional level using modern management technologies, in particular spatial forsite and territory marketing. The implementation of the infrastructural type of development of regional economic systems ensures an increase in the stability of the formation, functioning and modernization of spatially localized economic systems due to the formation of economically justified prerequisites for increasing the efficiency of the use of all types of resources and opportunities as part of the potential of a particular territory.

Keywords Regional economy · Regional infrastructure · Sustainable development · Territory marketing

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1 Introduction

The development of regional infrastructure of all types means, in the modern sense of the word, the implementation of a systemic paradigm of spatial socio-economic development, which has signs of systemic, complex sustainability and sustainability. It is the regional type of infrastructure development that will ensure the solution of significant national economic tasks in terms of "creating new and developing the economic potential of existing territorial centers of economic growth, reducing internal and interregional barriers to the mobility of all factors of economic activity, optimizing infrastructure costs and growing regional and national competitiveness of products and manufacturers in domestic and international markets".

2 Methodology

In modern regional economic science, the scientific landscape of regional infrastructure is one of the least developed in comparison with other categories (Table 1).

The interest of domestic researchers in the main categories of the regional economy increased significantly in 2010–2020, especially in terms of the problems of the formation and functioning of regional economic and socio-economic systems, as well as regional aspects of economic development and growth processes.

For the period 1900–2009, the total volume of publications on the problems of regional economic systems in the RSCI amounted to 52 units, and in 2010–2020—already 749 units, a similar dynamic was accompanied by a consideration of regional socio-economic systems (respectively 15 and 280 units).

In terms of regional development, the total volume of publications in the RSCI amounted to 865 units in 1900–2009, and already 5936 units in 2010–2020, on topics related to regional aspects of economic growth—18 and 116 units, respectively.

Against this background, research attention to the problems of regional infrastructure and its market direction was much less popular. During the period 1900–2010, 31 scientific works on regional market infrastructure (including 6 on regional market infrastructure) were presented in the RINC, during the period 2010–2020 this number grew to 503 units (according to regional market infrastructure—up to 11 units).

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as: Bukreev V. V. (Bukreev 2017) and Kaplina A. V. (2013). The materials from The Modeling the formation of territorial-industrial complexes (Modeling the formation of territorial-industrial complexes 1976) and Regional and municipal management of socio-economic development in the Siberian Federal District (2014) were used as a theoretical basis for this study.

Table 1 Publication activity in RSCI by basic categories of regional economy

Categories of regional economy	Articles in journals	Books	Conference proceedings	Deposited manuscripts	Theses	Reports	Patents
1	2	3	4	5	6	7	8
Regional economic system							
1900–2009	34	8	5	0	5	0	0
2010–2020	565	31	145	1	5	1	1
Regional socio-economic system							
1900–2009	4	4	4	0	3	0	0
2010–2020	205	14	56	0	3	1	1
Regional development							
1900–2009	356	193	173	95	42	6	0
2010–2020	3906	329	1612	8	69	9	3
Regional economic growth							
1900–2009	11	2	1	0	4	0	0
2010–2020	76	7	31	0	2	0	0
Regional infrastructure							
1900–2009	7	14	8	0	2	0	0
2010–2020	372	29	92	1	9	0	0
Regional market infrastructure							
1900–2009	3	2	1	0	0	0	0
2010–2020	5	3	3	0	0	0	0

Source Compiled by the author according to elibrary.ru 5.Zvereva (2015)

3 Results

The regional infrastructure and its market component within the territories of the Russian Federation for the period 1990–2020 underwent numerous quantitative and qualitative changes, largely determining the direction, scale and specificity of regional processes of economic and socio-economic development. Features of regional infrastructure development are affected in the fundamental works of A. G. Granberg, A. S. Novoselov, developed in the studies of V. V. Bukreev, A. Zh Bulikeeva, B. A. Delenyan, I. V. Zvereva, A. V. Kaplina, A. S. Marshallova and G. D. Kovalyova, M. G. Nikolaeva, N. V. Mordovchenkova and M. E. Pavlova.

When describing the fundamental model of the regional economic mechanism, A.G. Granberg does not directly name infrastructure industries, indicating, however, their need as federal regulatory systems that have a significant impact on such subsystems of the regional economy as the natural environment, production, gross accumulation and final consumption Granberg (2004).

We need also note that when studying the phenomenon and specifics of interregional trade, the respected author relies on the ideal market model and the absence of significant interregional barriers, assuming the materiality of the mechanism of price equalization for homogeneous products in related markets, due to the objective nature of transport and logistics expenses for the movement of goods between production and consumption centers.

In further attempts at descriptive research and modeling of the core of the regional economy, A. G. Granberg notes the systemically important fundamental role of the following regional economic processes:

- intraregional production of market and non-market economic benefits;
- the vital activities of the population of the Territory;
- financial flows accompanying the formation and expenditure of the regional budget;
- the relationship between these processes;
- indicators reflecting the direction and dynamics of the socio-economic development of the Territory (2004).

We emphasize that the author does not distinguish between the categories of territory of the region, regional economic space, economic environment and system, attempting to generalize them in a single term "economy of the region," although these subsystems are functional and have significant features of intersystem interaction, critical for the formation of the results of the functioning of the economy of a particular region and the management of its economic and socio-economic development.

A. S. Novoselov conducted a fundamental analysis of the evolution of methodological approaches to the implementation and evaluation of effective regional economic management, which identified 4 independent stages of qualitative evolution of scientific tools designed to ensure the manageability of regional economic processes, implement specific principles and priorities of regional development, introduce progressive management technologies and approaches to a complex multifunctional and multidimensional economic system of regional coverage (Novoselov 2008).

It should be noted that the initial stage of regional economic management, which was developed in 1970–1980 and took into account the need to develop the resources of the regional economic space, was precisely the infrastructure approach, implying the creation of specific territorial-industrial complexes as industrialized localized economic systems, provided with a full-fledged infrastructure of all types for economic activity and integrated into the national economic space (Larina 1979).

"Large TPC refers to a planned, proportionally developing set of steadily interconnected objects of sectors of the national economy (industry, agriculture, construction, transport, non-productive sphere), which are created to jointly solve one or more large national economic problems, concentrated on a relatively limited and necessarily compact (unconnected) territory with such a set and size of resources that are sufficient for TPK to participate in the solution of large people (Larina 1979).

"They make it possible to save labor, reduce capital investments, use natural resources in a comprehensive and rational manner, accelerate the timing of the creation of individual facilities and get a quick return on investments" (Larina 1979).

It should be emphasized that in the approach under consideration, the infrastructural provision of a specific localized spatial and economic system—TPC—was considered as a prerequisite for its functioning in the focal format of regional economic activity, which implied the selective development of priority natural resources of a particular territory. We also note that the economy of a particular region may not have meso-level specialized economic systems capable of economically efficient production and export of economic benefits beyond regional borders. In addition, the objective basis for the formation of the TPC was the "planned task for the supply of products," which in the modern Russian economy has been replaced by a poorly justified fiscal burden, which has already caused the degradation and disappearance of entire industries and economic activities.

When trying to formalize the system of the regional economy and identify significant relationships between its entities (planning and management, financial, information), A. S. Novoselov avoids identifying and naming the meso-level of the economic system, actually considering the economic entities of the micro-level (various enterprises and firms) and their connection and interaction with macro-level structures (represented in the figure bodies and institutions).

In the author's visualization, the infrastructure component of the regional economy is not represented at all, infrastructure functions were not included in the number of significant and significant connections between geographically localized economic entities, the relationships of the entities themselves in the regional economic space were not identified and analyzed, the phenomenon of openness of the regional economy and the possibility of intraregional/non-regional maneuver by all types of resources were ignored. At the same time, when implementing an empirical study of the features of the implementation of the state management function in relation to the management of regions of various types within the Siberian Federal District, A. S. Novoselov notes the need to consider infrastructure in the context of the composition and significance of regional economic development factors (Novoselov 2008).

The author's development presents an almost linear connection between the level of development of market infrastructure and the type of region allocated by the level of economic development: economically developed regions have a developed infrastructure, and depressed regions have an undeveloped one. However, when developing the methodology for monitoring and diagnosing regional economic processes and situations, the respected author again goes away from consideration of specific problems of infrastructure security on a territorial scale.

As a conclusion to the critical consideration of the above approach, we note that the infrastructure direction of the development of regional economic systems is named in it, but was not properly considered as a systemic factor that allows the development of the available resources of the regional economic space and is critical for the initiation and development of targeted regional and interregional economic processes.

A. Zh Bulikeeva in the author's study of the regional social infrastructure proposed an original methodology for joint assessment of the level of infrastructure security and quality of life, having received in the end an interesting but ambiguous classification of regions according to the criteria considered (Bulikeeva 2013).

The author came to an extremely interesting conclusion: the quality of life of the population of the territories is not in direct linear connection with the development factor of regional social infrastructure, and in some cases may directly contradict it! We note the promise of such empirical studies and the need to introduce additional factors that allow us to identify and assess the real nature of the interconnectedness and interdependence of infrastructure capabilities and the effectiveness of regional socio-economic processes, we also note the need to consider and evaluate the importance of other functional types of regional infrastructure for the functioning and development of the economy of specific regions.

I. V. Zvereva notes the need to allocate and consider regional infrastructure as an independent complex in the region's economy, focused on the provision of various services to material production sectors (in contrast, the author does not explain the difference between infrastructure and services). At the same time, the author refers to the actual production, as well as social, environmental, market and management types of regional infrastructure, noting its following significant features:

- the lack of uniformity in the provision of infrastructure capabilities for specific territories and the direct connection between infrastructure security and the level of socio-economic development of locations;
- regional infrastructure is considered by the author as one of the external factors determining the results of the functioning of the region's economy (without additional justification);
- promoting regional infrastructure development has a delayed multiplier effect on all types of regional economic processes (Zvereva 2015).

Agreeing with the substantive part of the author's message, we note the ambiguity of axiomatic assumptions regarding the consideration of regional infrastructure as an external development factor for the regional economic system, as well as very narrowed ideas about the interest and opportunities of regional authorities in the development of infrastructure.

In a study of the content and prospects for the implementation of regional policy implemented by A. S. Marshalova and G. D. Kovaleva under the leadership of A. S. Novoselov, the principle of advanced development of regional infrastructure is assigned to the long-term priorities of regional development (Marshalova et al. 2016).

Unlike the earlier works of A. S. Novoselov, in the study under consideration infrastructure development is included among the priority interests and opportunities of all stakeholders of the regional economy. At the same time, we fundamentally disagree with the author's conclusion regarding the lack of opportunities for the constituent entities of the Russian Federation or municipalities, as well as the population or certain types of corporate entities to develop regional infrastructure.

M. G. Nikolaeva and N. V. Mordovchenkov proposed a conceptual classification of the main types of regional infrastructure, indicating the need to consider it and

its characteristics as an independent subsystem in the regional economy (Pavlova 2015).

The authors see the economic function of the regional infrastructure in ensuring the streaming of all types of resources of regional market economy entities, "this is socially auxiliary capital that ensures the orderly and sustainable development of the regional economy on the basis of a set of conditions necessary for economic activities within a specific territory" (Nikolaeva and Mordovchenkov2010). At the same time, the authors emphasize the multiplicative nature of the factor of regional infrastructure security in relation to the growth of the quality of life of the population of the territories, recorded by them in relation to the regions of the Volga Federal District in 2001–2008 (which, as previously shown, is not a relevant relationship—A. Z. Bulikeyeva (2013), and is not confirmed, for example, by a joint analysis of labor productivity or migrations of various types). Moreover, for example, A. N. Kalashnikov in the author's study of problems of socio-economic differentiation in the Belgorod region emphasizes the importance not only of specific quantitative differences in various socio-economic parameters within a particular territory, but also the need to assess their perception, both by the resident population and potential migrants (Kalashnikov 2020).

We consider the most interesting and informative scientific development in terms of functionality and national economic significance of the regional infrastructure of recent years to be the approach of B. A. Delenian, who formulated a strategic infrastructure function in the regional economy and presented an original classification of its sub-functions (Delenyan 2019). The author proposes to define the regional infrastructure as "a set of systems, entities and elements that ensure the use of cash (from regional economic space) and deficit (through the use of interregional economic ties) resources in the activities of entities and institutions of the economy of the region, "its strategic function is seen in" the formation of a regional economic environment as a set of systematized, assessed, mobilized and ready-to-use resources necessary for initiating economic processes by entities represented in the economy of the region, "and includes among the key infrastructure sub-functions" 1. The possibility of initiating and safely conducting legal economic activities by various entities and institutions located within the regional economic system. 2. The possibility of obtaining a positive operational result of economic activity due to the use of absolute and relative advantages of the region. 3. Equal and equitable access to infrastructure resources (factors of production, goods, services, information) necessary to initiate economic activities (systematization of availability and assessment of economic efficiency of use of resources presented within the territory, regional and interregional maneuver). 4. Damping of fluctuations in price and non-price regional economic conditions outside the set of internal reserves and reserves, as well as regulatory management influences 5. Regional infrastructure as a set of specific activities, on the basis of which the emergence, development, functioning of commercial and non-commercial structures—entities and institutions of the regional economy are possible. 6. Contribution to the formation of the main (GRP; GRP infrastructure capacity) and final (incomes of the population—workers and owners) results of the functioning of the regional economic system" (Delenyan 2019).

4 Conclusion

The approaches considered provide a conceptual basis for further fundamental and exploratory research in terms of the functional and national economic significance of certain types of infrastructure as part of specific regional economic systems, and substantiating the prospects for building up a specific type of regional infrastructure capacity in view of the relevance of spatial development challenges in the coming years, especially in addressing systemic socio-economic problems, without which regional competitiveness and productivity growth priorities cannot be achieved, both domestically and internationally.

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Current Activities of Russian Pharmaceutical Development Companies: Analysis and Development Prospects (on the Moscow Region Example)

Elena A. Bryzgalova-Plan, Marina V. Kovshova, Lidiya B. Larina, Irina O. Ryzhova, and Svetlana N. Lobanova

Abstract The purpose of this research is to analyze the activities of Russian pharmaceutical development and research companies at the present stage and the prospects for their development (on the Moscow Region example). The authors scrutinized the works of Russian and foreign authors to perform this research. The following scientific methods were used to achieve the goal: scientific observation, analysis, comparison, complex method, system approach, and graphical method for presenting results. The authors analyze the path of the market of the development and research of new medicines. This path was completed during the Soviet, transitional (after 1991) and modern periods. The article will help specialists to see the current challenges of this market more deeply and widely. The activities and financial conditions of private Russian pharmaceutical development companies were also thoroughly scrutinized. Despite the presence of high risk and high competition, as well as direct dependence on changes in legislation, the market of pharmaceutical development services is in a state of constant development and it is very promising in Russia. This research analyzes the development path for the modern market of the development and research of new medicines, which can be useful both for scientists and for business environment representatives in Russia and abroad.s

Keywords Pharmaceutical industry · Pharmaceutical development · CDMO · CRO · Clinical trials

JEL Code I20 · I23 · L65 · L84 · O30

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1 Introduction

In any country the state of the pharmaceutical industry affects the socio-economic development, the health and quality of life of citizens, etc. The national security of a state is directly related to the current state and development of its pharmaceutical industry. It is obvious that at the present stage, innovation is the "engine" of the development of this industry. Also, according to the classification of industries by archetypes developed by the Mc Kinsey Global Institute (MGI), the pharmaceutical industry belongs to the innovation archetype (McKinsey Global Institute 2020). It is obvious that innovations play an important role in the development and creation of new medicines, in the development of new drug production technology and control methods, in the organization of business processes both in a single company and in the entire industry as a whole.

In this study the author analyzes the activities of modern Russian companies that are engaged in the development and creation of new medicines.

2 Materials and Methods

Problems in the new drugs development and research have been studied in the works of Scannel et al. (2012), Emanuel et al. (2015), Hull (2015), DiMasi et al. (2016), Dolgos et al. (2016), Grabowski et al. (2016), Bryzgalova et al. (2020).

The author has used the methods of scientific observation, analysis, comparison, a complex method, a systematic approach and a graphical method to present the results.

3 Results

If we want to understand the new medicines development and research market in the modern Russia, it is necessary to analyze its development path (Fig. 1).

In the USSR the medicines development and production were supervised by the Ministry of Health and the Ministry of Medical Industry. The chemical-pharmaceutical industry was the part of the medical industry.

The pharmaceutical development was conducted in Research Institutes. The first step was the Basic (fundamental) research. The Institute of Bioorganic Chemistry (Moscow), the Institute of Chemical Biology and Fundamental Medicine (city of Novosibirsk), the Institute of Biochemistry and Genetics (city of Ufa) were among the major Research Institutes engaged in fundamental research during the Soviet period.

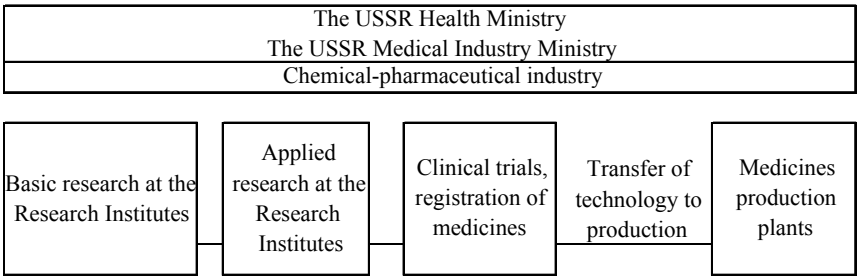

Fig. 1 Development, registration and production of medicines in the Soviet period. *Source* Developed and compiled by the authors

Applied research was the second step. The Chemical-pharmaceutical Research Institute, the Research Institute of new antibiotics, the Research Institute of Pharmacology were among the major Research Institutes engaged in applied research during the Soviet period.

The medicines registration (including foreign ones) was carried out in accordance with established procedure approved by the Pharmacological and Pharmacopoeia committees (were authorized by the order of the USSR Health Minister) (Lepakhin et al. 2016). The medicines registration took place only after the successfully passed preclinical and clinical trials. After the registration step the production technology was transferred to the pharmaceutical plants.

When the Soviet Union collapsed, the pharmaceutical industry experienced difficult times: the significant decline in the domestic medicines production, the moral deterioration of equipment, poor funding for basic and applied research, etc. But despite all this, activities in the new medicine development field did not stop. Private companies started to work in this direction too.

The first private pharmaceutical development companies appeared in the early 1990s and were of domestic origin. The first of them were "Institute of Pharmaceutical Technologies", CJSC and the group of companies "Chemrar". Both companies were founded by talented scientists, respectively by S. A. Kedik and by A. V. Ivashchenko. For more than 25 years, both companies have had very serious development paths. Their scientific capabilities have significantly expanded. They offer a wide range of pharmaceutical development services.

Farmcenter VILAR, JSC was created on the basis of the plant "VILAR", with a strong scientific base. This company began to provide a full range of pharmaceutical development services too.

In the 2000s, the international companies provided pharmaceutical development services began to appear. The Servier R&D center, Sofarma company, ABBA RUS, JSC should be mentioned among them. These companies are engaged in pharmaceutical development, preclinical and clinical trials, contract production services. In the 2000s two domestic companies (Innovative Pharmacological Developments, LLC (IFAR) and Probiotech, LLC) were created by scientists. Both companies provide a wide range of pharmaceutical development services.

In 2012 the Novamedica Innotech R&D center was established with the state funds (RUSNANO, JSC) and the funds from the American Venture Fund Domain Associates, LLC. The Novamedica Innotech R&D center provides a full range of pharmaceutical development and research services. The Novamedica Innotech R&D center is the most similar in structure to CDMOs in the USA and Western Europe.

On the West CDMOs provide pharmaceutical development services and contract production services. Russian pharmaceutical development companies provide contract production services far less.

The Russian pharmaceutical development companies are mostly concentrated in the Moscow Region (Moscow and Moscow area): "Institute of Pharmaceutical Technologies", CJSC; "Chemrar"; Farmcenter VILAR, JSC; the Servier R&D center; Sofarma company; ABBA RUS, JSC; Probiotech, LLC; the Novamedica Innotech R&D center. It's very simple to explain. The Moscow Region has one of the most powerful scientific and innovative potential in Russia. There are many well-known research institutes with advanced scientific schools, science cities, innovation centers, technology parks, and major universities there.

IFAR is located in the Tomsk Region. The Tomsk Region also has the strong scientific potential. There are the Tomsk scientific center the Siberian branch of the Russian Academy of Sciences presented by five Research Institute, the Tomsk scientific center, the Siberian branch of the Russian Academy of medical science presented by six Research Institutes with well-known scientific schools and universities there.

The authors presented the revenue and EBIT indicators of domestic pharmaceutical development companies (Table 1, Fig. 2). In 2017–2019 the revenue tended to grow for Chemrar, Farmcenter VILAR, JSC, R&D Novamedica Innotech. The revenue tended to decrease in "Institute of Pharmaceutical Technologies", CJSC, Probiotech, LLC, IFAR.

In 2017–2019 the EBIT tended to grow for Chemrar, Farmcenter VILAR, JSC. The EBIT tended to decrease in Probiotech, LLC, R&D Novamedica Innotech.

Institute of Pharmaceutical Technologies, CJSC and IFAR had the unstable EBIT.

Table 1 Revenue and EBIT of the domestic pharmaceutical development companies in Russia, in thousands of RUB

Name of company	Revenue			EBIT		
	2019	2018	2017	2019	2018	2017
Institute of Pharmaceutical Technologies, CJSC	97,195	169,519	327,854	20,840	9072	237,003
Chemrar	434,201	427,802	288,987	67,069	38,610	–
Farmcenter VILAR, JSC	1,041,110	930,832	735,940	135,443	92,307	39,027
Probiotech, LLC	64,889	67,801	80,939	0	0	8382
R&D Novamedica Innotech	121,995	111,121	0	−53,092	−39,928	0
IFAR	51,250	47,974	104,306	7276	394	42,866

Source Developed and compiled by the authors on the basis of accounting reports of companies

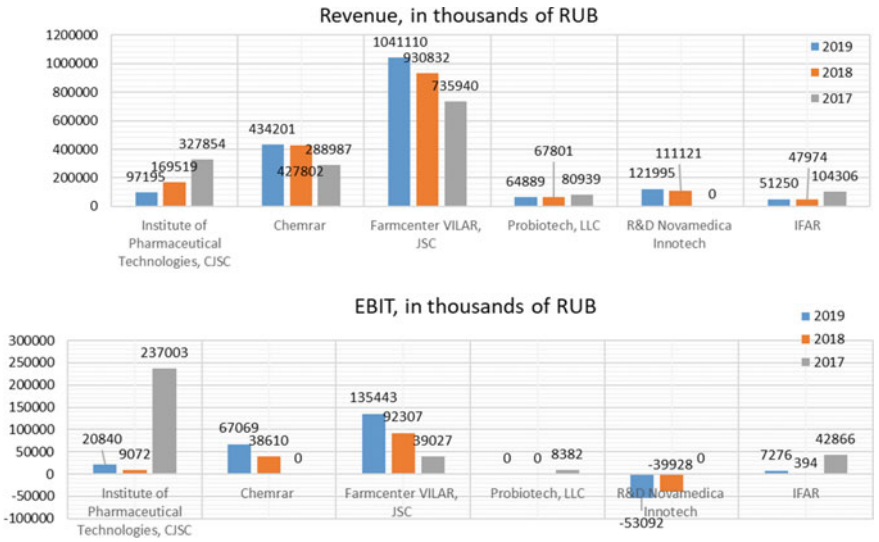

Fig. 2 Revenue and EBIT of the domestic pharmaceutical development companies in Russia, in thousands of RUB. *Source* Developed and compiled by the authors on the basis of accounting reports of companies

The authors presented the profitability indicators of domestic pharmaceutical development companies: return on sales ROS, return on equity ROE, return on assets ROA (Table 2, Fig. 3).

In 2017–2019 ROS grew in Chemrar, Farmcenter VILAR, JSC. ROS decreased in Probiotech, LLC, R&D Novamedica Innotech. IFAR and "Institute of Pharmaceutical Technologies", CJSC had unstable ROS.

In 2017–2019 ROE grew in Chemrar, Farmcenter VILAR, JSC. ROE decreased in Probiotech, LLC, R&D Novamedica Innotech. IFAR and "Institute of Pharmaceutical Technologies", CJSC had unstable ROE.

In 2017–2019 ROA grew in Chemrar, Farmcenter VILAR, JSC. ROA decreased in R&D Novamedica Innotech. IFAR, Probiotech, LLC and "Institute of Pharmaceutical Technologies", CJSC had unstable ROA.

Chemrar and Farmcenter VILAR, JSC have the most stable financial positions. The rest of the companies have an unstable financial situation. This is due to high competition in the industry, especially with foreign companies, and the unstable economic situation.

Further all new medicines should successfully pass clinical trials. The clinical research market began to form in the early 2000s in Russia. This market is quite young and is in the process of development. This market is considered promising.

Due to the global trend of transferring clinical trials from the Western countries to China, India, and Russia and so on, although most of them are still held in Western countries (Alemayehu et al. 2018). All medicines should be registered in the Health Ministry of Russia.

Table 2 Profitability indicators of domestic the domestic pharmaceutical development companies in Russia

Name of company	ROS, %			ROE, %			ROA, %		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Institute of Pharmaceutical Technologies, CJSC	26.9	3.7	72.6	11	4	207	4,6	2.3	92
Chemrar	20.4	2.3	–	26	18	–	9.6	7.8	0
Farmcenter VILAR, JSC	21	17.7	7.5	22	18	10	14.3	9.4	5
Probiotech, LLC	0	0	10.6	81	−5	49	6.8	−0.3	4.3
R&D Novamedica Innotech	−49.7	−42.5	–	−8	−14	0	−7.3	−5.2	0
IFAR	14	−5.3	34.5	3	−1	26	2	−0.6	17.8

Source Developed and compiled by the authors on the basis of accounting reports of companies

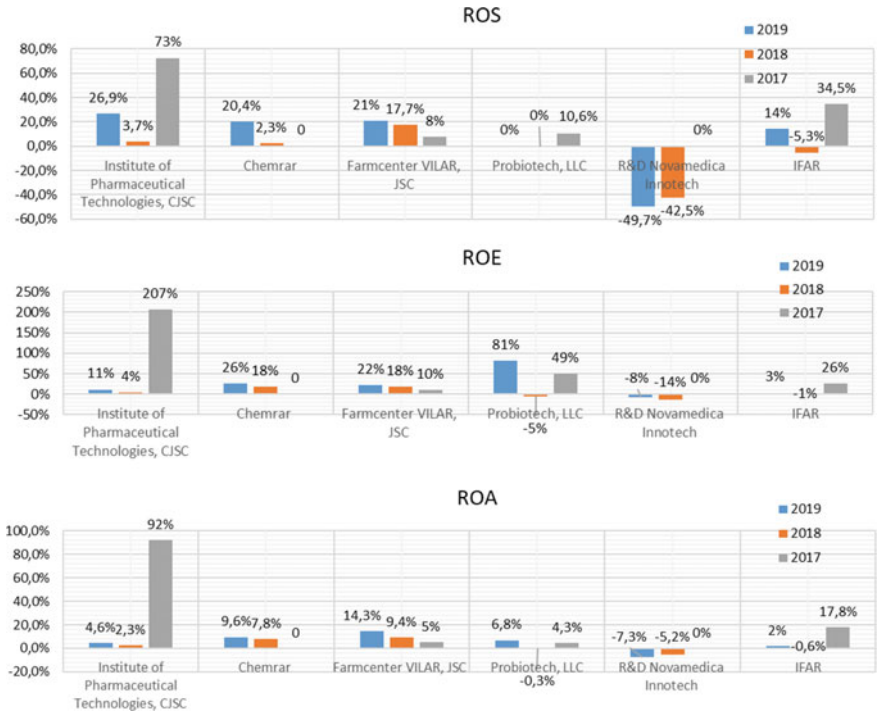

Fig. 3 Profitability indicators of domestic the domestic pharmaceutical development companies in Russia. *Source* Developed and compiled by the authors on the basis of accounting reports of companies

One of the features of the Russian clinical trials market is that many domestic pharmaceutical producers still prefer to conduct the clinical trials by their own, rather than to outsource it to CRO (contract research organizations), as in the Western countries.

The Russian clinical trials market was initially formed by international CROs in the late 1990s. Such companies as Quintiles, MB Quest (Pharm-Olam International Group of Companies), PSI, PharmaNet, ClinStar were among the first of them in Russia.

A little bit later Russian CROs began to appear, for example, Synergy Research Group, Rusclinic, OST, Smuz Drug development, Atlant Clinical, IPHARMA, KlinPharmInvest.

The Russian clinical trials market is estimated at about 1 billion US dollars per year, according to the Russian CRO Atlant Clinical.

4 Conclusion

In the early 1990s, the Russian pharmaceutical development market began to be formed by the domestic companies. Foreign companies began to appear in this market in the early 2000s.

The clinical trials market began to be formed by the foreign companies. The Russian CROs began to appear on this market a little later.

The Russian pharmaceutical development market is in the process of development and is very promising, especially in the Moscow Region. There is a lot space to grow and to develop. Due to the Federal target program "Development of the pharmaceutical and medical industry of the Russian Federation", it has become easier for companies to receive state assistance. The Government is aimed at developing innovative activities in the country. It is important to highlight that the Moscow Region has very high scientific potential, high level of training of scientific personnel. Despite the fact that in the 1990s the "brain drain" was great.

The new medicines development and research market is characterized by high risk, high competition, and direct dependence on changes in legislation.

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Regional Economic Policy in Dairy Production

Alexander E. Suglobov and Rishat R. Khabipov

Abstract The research relevance is connected with the need to increase dairy resources in small forms of farming, increase the level of organization of dairy cattle breeding, and form a stock of dairy products in the conditions of sanctions and embargo. Using the methods of economic research, the authors analyze the development of dairy cattle breeding in the Republic of Tatarstan. Moreover, the authors reveal current trends in production, procurement, and sales of milk and milk products by agricultural producers of different management forms. Additionally, the authors reveal the reserves for increasing the efficiency of the potential use in the dairy sector. The authors develop proposals for expanding economic activity in cattle breeding for small farms. Moreover, the authors propose ways of increasing the role of consumer agricultural cooperation in the development of dairy cattle breeding in peasant (farm) enterprises and private subsidiary farms by improving the forms and methods of state support for the replenishment of dairy herds with pedigree cows. The authors also put forward proposals on creating consumer purchasing and marketing cooperatives to sell milk and dairy products produced by rural residents and farms. Additionally, it is proposed to increase the competitiveness of consumer purchasing and marketing cooperatives in the market of milk and dairy products by increasing scientific support for their activities.

Keywords Regional economic policy · Milk · Peasant (farm) enterprises · Private household · Private subsidiary farms · Private households · Dairy cattle breeding · Consumer cooperatives · Farmers

JEL codes O13 · P25 · P48

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1 Introduction

Small business in agriculture includes farmers, individual entrepreneurs, and other rural residents producing dairy products. This business has significant potential for the development of dairy cattle in a market environment, the revival of the village, the inclusion of small and medium-sized enterprises in economic activities, and the development of the dairy market. To ensure the effective functioning of small dairy farms, it is necessary to organize a guaranteed sale of products, build an effective logistics chain, and ensure coordinated interaction of all links of dairy farms. In current conditions, it is possible to improve the efficiency of peasant (farm) enterprises and private subsidiary farms in the sphere of dairy cattle breeding by implementing a scientific approach to the development of the production base of the dairy industry, increasing the productivity of dairy herds, and creating a reliable channel to promote dairy products from producer to consumer using the advantages of cooperation.

2 Materials and Methods

The theoretical and methodological basis of the research includes the established scientific methods, works of Russian scholars (Balalova et al. 2021; Bessonov and Suglobov 2019; Dudukalova et al. 2020; Kontsevaya et al. 2020; Maksaev et al. 2021; Maloletko et al. 2021; Mityushina et al. 2017; Nabiyeva 2021; Orlova et al. 2020; Rodionov et al. 2020; Shinkareva et al. 2021; Starodubtseva et al. 2021; Volkov et al. 2018), and recommendations of research institutions on this topic. The assessment of the current level of operating forms of the dairy complex involves methods of knowledge, analysis, and synthesis, as well as monographic and abstract-logical methods. Innovative approaches were used in forecasting the directions of the development of dairy farming. Additionally, the authors used the statistical materials of the Ministry of Agriculture of Russia and the Republic of Tatarstan and other open publications.

3 Results

When studying small production forms in dairy farming, the authors identified and disclosed how the development of agricultural cooperation is connected with the contribution of peasant (farm) enterprises and private subsidiary farms in providing the food market with milk and dairy products. The authors propose mechanisms to improve the efficiency of small farms in the marketing of milk and dairy products. Moreover, the authors identify the place of consumer cooperatives in strengthening the role of farmers in the dairy market.

Milk and its products occupy an important place in the diet of the population in many countries. According to the FAO, the world produced 843 million tons of milk

in 2018 and about 859 million tons in 2019. The top milk producers are India (196 million tons), the EU (168 million tons), the US (100 million tons), Pakistan (47 million tons), Brazil (36 million tons), China (31 million tons), and New Zealand (22 million tons). Russia produced 30.6 million tons of milk in 2019. However, it is important to keep in mind that there will occur many negative consequences, if agricultural production and services are concentrated mainly in large holdings and retail chains.

In some regions, insufficient attention to small forms of farming in rural areas often leads to the ruin of small and medium-sized enterprises (SMEs), thereby forcing the rural population out of production and aggravating the problem of rural development. In 2019, the share of small farms in the all-Russian volume of milk production was 45.9% (Fig. 1).

It should be noted that with the increase in milk production in small farms, there emerge problems with marketing dairy products. In this case, cooperation should help producers. Even though federal and regional authorities have recently stimulated cooperation in small forms of economic activity, there remain some difficulties. In recent years, Russia has formed a certain regulatory and legal framework and developed mechanisms to support cooperative projects in small farming.

Small farming plays a significant role in developing the country's economy and agriculture, including the functioning of dairy farming. Peasant (farm) enterprises, private subsidiary farms, and individual entrepreneurs occupy an important place in the food supply of the country (including the dairy supply), the organization of employment and income of the rural population, and the formation of the middle class in the countryside. Rural farms perform forest-forming functions, preserve the

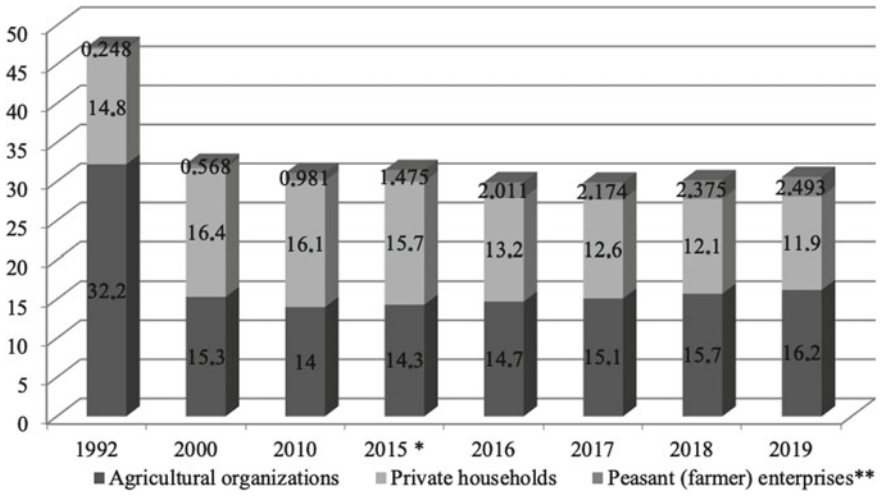

Fig. 1 Milk production trends in Russia. *Source* Compiled by the authors based on Federal State Statistics Service (2020). *Note* *From 2015—in weight after refinement. **Including individual entrepreneurs

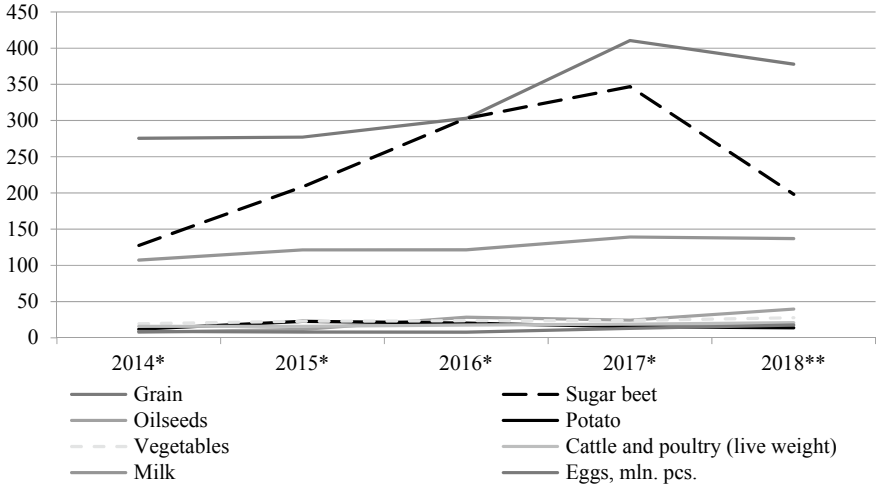

Fig. 2 Dynamics of sales in agriculture of the Republic of Tatarstan, thousand tons. *Source* Compiled by the authors Federal State Statistics Service (2020). *Note* *The data is recalculated based on the results of the 2016 All-Russian Agricultural Census. **Including individual entrepreneurs

rural landscape, lifestyle, and traditional culture, and help fill local budgets in rural areas.

The experience of the Republic of Tatarstan (including the cooperation of small farms in the dairy production of the region) is of great interest for improving the efficiency of dairy complex functioning (Fig. 2).

The increase in efficiency (Fig. 2) was made possible by the agricultural policy pursued by the state authorities of the agrarian sector. The support allowed the villagers to strengthen the potential of their farms, build livestock facilities, purchase hundreds of thousands of cattle, and develop rural territories. Since 2010, the budget of the Republic of Tatarstan has provided annual support to keep milking cattle in farms of the population. In 2010–2019, the government allocated over 3 billion rubles for these purposes. This support allowed to herd more than 100 thousand dairy animals in conditions of a serious reduction of the rural population.

In 2010–2011, the Republic of Tatarstan started the development of family farms. The government reimburses part of the costs for constructing family farms (up to 1 million rubles) from the republic's budget. Moreover, the government of the Republic of Tatarstan signed agreements with municipal districts on the provision of similar support from local budgets on the co-financing principles. Funds are also allocated for the purchase of livestock, processing equipment, or construction of access roads.

In 2012, the Republic of Tatarstan created programs to support the development of family farms and beginning farmers to develop programs to support family farms and beginning farmers, which allowed to increase the number of farmers engaged in livestock breeding. While previously, only every 15th farmer was engaged in cattle breeding, then by 2019, there were more than half of them. The number of family

farms increased from 300 to 1200 in 7 years, the number of livestock doubled (except pork), the number of poultry tripled to 2.1 million heads.

In 2015, the Republic of Tatarstan started the program of constructing mini dairy farms in private subsidiary farms of population. For six years, the state support of 358.5 million rubles, allocated under the program, allowed the construction of 1,865 mini-farms on 12 thousand cows in private farms. In total, epy participants of the programs ensured an increase of more than 5 thousand cows.

For 2013–2018, the average annual increase in production in peasant (farm) enterprises was 13.9%, with a 3.2% increase in all categories of farms in the republic. This allowed increasing their share from 5.9% in 2013 to 9% in 2018, including from 7.2 to 10.7% in crop production and from 4.7 to 7.3% in livestock. Over five years, the production of grain saw a three-fold increase (from 110 thousand tons in 2013 to 340.6 thousand tons in 2018), largely due to an increase in yields by 10 c/ha.

A rise in crop yields substantially facilitated the increase in crop production. Thus, in 2017, compared to 2013, the yield of grain crops increased from 19.4 to 30.9 c/ha, potatoes—from 164.2 to 214.4 c/ha (30.6%), sugar beet—from 322.3 to 414.3 (28.5%) (Fig. 3).

Active support from the republican and federal budgets for the construction of family farms has become a serious reserve for growing cattle breeding. The production of meat and poultry increased by 5 thousand tons, milk—by 2.3 times, and eggs—1.8 times.

With the federal co-partnership, the Republic of Tatarstan actively carries out the work on implementing the programs "Development of family farms" and "Support of beginning farmers." Thus, over six years, 821 collective farms received grants for 1.6 billion rubles; 121 collective farms received grants for 375 million rubles, including 66 collective dairy farms with 4028 cows and 25 collective farms for fattening of 2045 cattle.

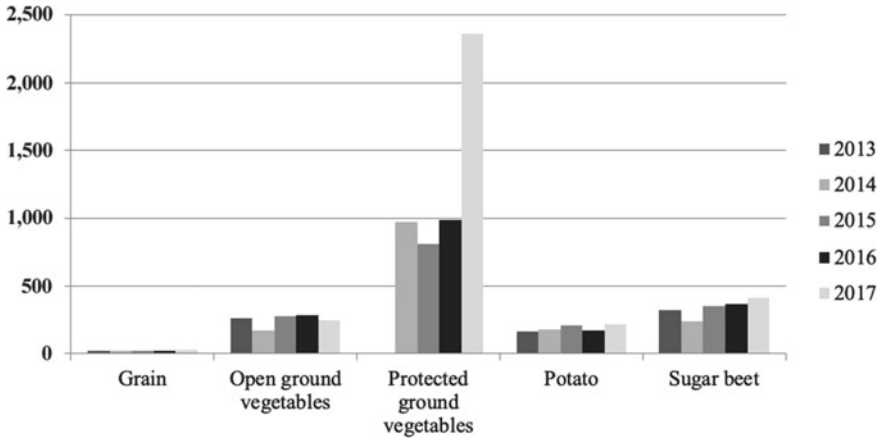

Fig. 3 Dynamics of yields of major crops in the Republic of Tatarstan, centner per 1 ha. *Source* Compiled by the authors based on Federal State Statistics Service (2020)

The role and importance of increasing funding for grant support activities in the creation of cooperatives are increasing. For example, in 2020, the program "AgroStartup" received 300 applications for 1.2 billion rubles, with the planned funds for these measures amounting to 159 million rubles. Calculations show that about 500 million rubles should be allocated annually to support agricultural consumer cooperatives created by peasant (farm) enterprises and private subsidiary farms. At the same time, we consider it advisable to include private subsidiary farms in the list of recipients of soft loans at the federal level.

This problem can only be solved by creating a well-developed network of sufficiently powerful agricultural cooperatives of all kinds. After all, the essence of agricultural cooperation is expressed precisely in the organization of individual activities of agricultural producers on a large scale while maintaining their economic independence.

The main goals (advantages) of organizing a cooperative are:

- Gaining an advantage in marketing products;
- Reducing costs;
- Gaining access to markets or expanding market opportunities;
- Improving the quality of products or services;
- Buying goods (services) not available on the market;
- Flexible work production;
- Reducing costs and increasing income.

4 Discussion

The history of the development of agricultural production in many countries shows the effectiveness of cooperation in this area. In particular, the level of agricultural development in countries such as Finland, Denmark, and the Netherlands is inextricably linked to an effectively built agricultural cooperation model.

Russia also has its own extensive history of the cooperative movement (the first decree of the Russian government on cooperation was adopted in 1889), although it imposes a relatively strong negative imprint on the current state of this integration form.

The current stage in the development of agricultural cooperation dates back to adopting the Law "On Agricultural Cooperation" No. 93-FZ in 1995. In 1995–1999, the adoption of law No. 193-FZ caused a relatively smooth but quite a high growth in the number of cooperatives, especially noticeable against the background of their bankruptcy in the early 1990s. Simultaneously, the rate of the subsequent decline in the number of representatives of this organizational form significantly exceeded the level of their growth.

The number of agricultural consumer cooperatives increased by more than 2.5 thousand units against the background of developed stimulus measures. However, about 35% of them remained in black and white. Therefore, the effect of existing cooperatives in the agricultural market remained at the level of statistical error, which

quite predictably led to another decline in the number of cooperatives by 2010. We are currently witnessing the third wave of cooperative activity, prompted by the government's initiative. Still, the question on the quantitative and qualitative composition of cooperation in agriculture remains open. Currently, consumer cooperatives include about 1% of individuals engaged in private subsidiary farms, almost 2% of farmers, and 5% of agricultural organizations.

The analysis shows that the main reasons for the decline in the number of cooperatives are as follows:

- Imperfect legislation;
- Lack of state support;
- Lack of incentives for small businesses to join cooperatives.

An essential role in the development of agricultural production is played by the development of consumer cooperation, which is inseparably linked with the development of rural areas. This relationship has become particularly noticeable in the last few years with the strengthening of support measures in the industry.

Cooperation provides an increase in the availability of financial resources for farming and an increase in production efficiency due to economies of scale.

Agricultural cooperatives can be divided into two groups: (1) production (agricultural artel, fishing artel, and cooperative farm) and (2) consumer (processing, marketing (trade), supply, service, credit, livestock, and insurance).

Since 2018, the Republic of Tatarstan has improved the measures of state support for the development of agricultural cooperation, which increased the intensity of the development of the cooperative movement. In 2019, more than 3 thousand new members (primarily private subsidiary farms) were involved in the cooperatives. Cash proceeds of agricultural consumer cooperatives grew to 2.9 billion rubles. The development of cooperatives is facilitated by an increase in the volume of grant support. In the Republic of Tatarstan, 43 cooperatives received grants for 827 million rubles under the federal program in 2015–2019. Additionally, in 2018–2019, 27 start-up cooperatives received grants of 125 million rubles from the program of the Republic of Tatarstan; 27 start-up cooperatives received grants of 125 million rubles under the national program, which allowed to increase the volume of their activities. In the same year, subsidies for 98.8 million rubles were allocated to 29 cooperatives on 61 applications.

In 2018, the Republic of Tatarstan provided information and advisory services to support farm dynasties and allocated 100 thousand rubles for 15 families each. In 2019, the republic received grants of 312.7 million rubles, and 29 cooperatives received 98.8 million rubles for 61 applications.

5 Conclusion

The research allowed us to identify the main factors affecting the activities of small farms. The authors recommended implementing a segmentation marketing approach

to the market of milk and dairy products. One of the directions of increasing the efficiency of the dairy industry in small forms of farming is the intensification and optimization of production and providing sales based on the development of cooperation.

The authors proposed to improve the state regulation of the purchase price of milk and milk products and simplify the mechanism of granting soft loans. It is proposed to create reserve land funds for farmers in municipal districts of the Republic of Tatarstan.

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Typology of Regions by Structural-Investment Type and Economic Dynamics

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Abstract The investment policy of the state, the dynamics and orientation of the investment process determine the nature of structural economic transformations in the regions and in the country as a whole. The difficulty of ensuring an effective educational process lies in the need for a targeted approach to each particular region, based on its characteristics, macroeconomic, production and other indicators. Interregional differences in economic indicators, growth rates, structural characteristics change, based on world economic trends in the development of certain industries, the development of new types of economic activities. Structural stratification implies differences in investment activities. The organization of the investment process requires taking into account the parameters of individual regions, which actualizes the tasks of their typologization, to detail certain factors that affect the effectiveness of the investment process, the potential for gross product growth. The Russian economy includes several sectoral types, based on the peculiarities of resource concentration, the predominance of certain industries is formed, which makes it possible to ensure a targeted approach to the development of investment policy in the region, based on the parameters of each individual region and its qualification type. So you can distinguish regions in which the mining industry prevails, in others—manufacturing, part specializes in agriculture, in the fourth type an accent share belongs to the service sector. In each of the mentioned groups of industries, investments in fixed assets in various ways affect the dynamics of gross regional product, which cannot but

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affect the regional specifics of the effectiveness of investments in fixed assets and investment return. The article considers regional features of investment influence on dynamics of gross regional product in different groups of regions, proposes a system of assessments to support strategic priorities in their development. The place and role of the investment factor in the formation of regional economic dynamics are determined.

Keywords Investment · Globalization · Regional economic development · Raw materials and demographic profile of the region · Type of urban settlement

JEL Codes R01

1 Introduction

The structural changes of the economy and the trend towards deglobalization update qualitatively new research issues associated with the development of individual regions as independent economic entities designed to ensure comprehensive development and sustainable economic growth at the expense of their own resource and investment potential. This process is complicated by the distinction between the qualitative characteristics of regions, their macroeconomic and production indicators, the level of economic development and economic potential. The stratification of regions according to many parameters sets the task of developing a methodology of their typology in the development of high-quality investment solutions that take into account the characteristics of individual regions, their potential, existing barriers and restrictions. The typology of the regions of Russia requires can be carried out according to various criteria, building a rating according to certain quantitative characteristics and qualitative parameters. An important area of research is the classification of regions and the construction of a structure based on the structural and investment type and economic dynamics to increase the effectiveness of state regional policy. Improving the methodology of the typology of regions requires a number of key tasks:

1. Development of regional policy measures aimed at optimizing regional economic policies in order to improve the region's capacity to enter the interregional and global markets;
2. Development of an algorithm for selecting and justifying decisions on investing in projects of the region based on the typology of regions, typology of the region allows them to be ranked according to priority parameters and identify the most advantageous options for investing funds in terms of reliability and payback of investments, their role for regional economic development and other criteria;
3. Solving scientific and applied problems aimed at the development of technologies in the region in order to increase the effectiveness of its activities and eliminate contradictions in the development levels of the scientific and applied sector.

The purpose of this work is to develop the methodological aspects of the typology of regions based on the selection of various criteria that affect the level of regional economic growth and investment potential.

2 Materials and Methods

The main conclusions of the research are based on general scientific methods: scenario modeling, synthesis and analysis, grouping, regression analysis, stochastic analysis, etc. A comprehensive approach made it possible to identify patterns depending on factors, systematically approach the typology of regions, highlighting key parameters for ranking.

The study, generalization, evaluation of theoretical approaches to the typology of regions and the systematization of ranking criteria based on the works of domestic and foreign economists allows us to substantiate and logically verify conclusions and conclusions, thereby consolidating the reliability of the research results. During the study, in order to clarify and systematize the parametric data of the regions, it was assumed that gradation, ranking and typology as a method of scientific knowledge is not devoid of inaccuracies and is subjective. In particular, the classification criteria are generalized, the indicators for which grouping is carried out are averaged, which makes the final result generalized. Also the statics takes place, i.e. the group is tied to socio-economic indexes of development of the separate temporary period, i.e. in the course of classification, ranging, divisions into various groups and types the majority of methods and approaches don't consider long-term and short-term dynamics of development of territories, areas and regions.

An examination of the work on methodological aspects of ranking, classification and typology of regions according to basic and given parameters revealed the potential for refining the methodology based on additional research in order to form an empirical base, introduction of additional parameters into the classification, study of factors that determine the current state of regions and allow them to be evaluated in the long term, reflect the dynamism of socio-economic processes that affect the rating of the region and the potential for its economic growth and development.

The disadvantage of the studied methods of regional typology is narrow direction, since individual methods allow targeted structuring of socio-economic and innovative types of regions, but do not give a comprehensive assessment. The long-term focus on the sustainable socio-economic development of the constituent entities of the Russian Federation requires an integrated approach and the formation of a typology according to a wide range of criteria, thereby forming an integrated approach and creating conditions for the integration study of parameters that predetermine the development of the economy, innovative development and long-term economic growth.

One of the key methodological tasks that were set during the study was the selection of parameters, indicators or indicators for typology and classification of regions. This preparatory stage was not only the sampling, ranking and determination of the significance of each individual parameter, which contributes to their quantitative

assessment for classification of regions, but also the determination of the relationship between indicators to exclude assumptions in models. An essential condition for the selection of indicators is the ability to reflect the individuality of the individual region, comparability and characteristics for all regions. Thus, the criteria selection conditions pose a time-consuming analytical task, but the qualitative development of this stage will significantly increase the effectiveness of analytical procedures and ensure a high result.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as Bessonov and Suglobov (2019), Makrusev et al. (2019), Gupanova et al. (2019), Safiullin et al. (2013), Safiullina et al. (2014), Vakhitov et al. (2019) and Zhilina et al. (2021).

3 Results

In order to identify additional parameters of classification and regional ranking based on regression equations, preliminary calculations were carried out to identify the tight relationship between economic criteria and to exclude factors of indirect influence on the investment potential of regions. In particular, the minimum average annual growth rate of fixed capital investments allows us to identify the growth potential of real gross regional product, simulate its dynamics, thereby proving the attractiveness of the region from the point of view of socio-economic development, the possibility of its strategic long-term development. The calculated dependencies made it possible to substantiate the nature of the influence of the demographic situation on the macroeconomic indicators of the region, assessing them in retrospect and building a forecast in the horizon of 10–15 years.

Using the model will allow calculating the size of the regional economy (in real terms), which needs to be achieved when the demographic situation worsens.

The methodology for calculating the minimum average annual growth rate involves changing the parameters of the regression equation at = ah + in, by including deflators—gross regional product in the context of the studied regions. Thus, Jp = Dx + Fq. Based on the solution of the equation with respect to x, we calculate x min as

$$x\ \min = (Jp - c)/a.$$

The next stage is the study of the obtained dependence, an integral stage of which should be the systematization, refinement and, generalization of parameters, in order to identify correlation links and build a system of indicators that illustrates the dependence between the indicated parameters and allows ranking regions, dividing them into certain types, based on the results obtained.

At the next stage of the methodology, investment efficiency is compared within previously identified and systematized based on quantitative or qualitative parameters

of the regions, the target function of which is to increase the set of effective indicators based on the calculation of the average rate of dynamics of the gross republican product.

You can use the formula:

$$\overline{y}_{ik} = \sqrt{y_{\text{I}} y_k}$$

By setting the target function of maximizing the average growth rate of investment potential and gross regional product, it is possible to maximize $\left(\overline{y}_{\text{IK}}\right)^2$. Therefore, it is possible to formulate a function of the parameters of the regression equation to identify criteria for classification and ranking of regions depending on the growth rate of investment and GRP. Then the following task:

$\max\left[\left(\hat{a}_{\text{I}} x_{\text{I}} + \hat{e}_{\text{I}}\right)\left(\hat{a}_{\text{K}} x_{\text{K}} + \hat{e}_{\text{K}}\right)\right]$

$$\begin{cases} x_I \geq x_{\text{Imin}} \\ x_K \geq x_{K\text{min}} \\ x_I \times x_K = (\overline{x})^2 \\ x_I \leq x_{\text{Imax}} \\ x_K \leq x_{K\text{max}} \end{cases}$$

with limitations

Using this equation, during the research it is possible to calculate probabilistic values of the growth rate of investments in production capacities and fixed assets in each region separately and in the analyzed system as a whole. The evaluation uses a wide array of parameters, assuming that the criteria range from minimum to maximum.

The quadratic nature of the objective function allows you to remove the constraints in the system of equations and take them into account as an assumption in the model in question. You can find the extreme point of parameter optimization under the assumed assumptions using the following approach. The point of extreme becomes the point of minimum, reached at:

$$x_{\text{I}} = \overline{x} \times \sqrt{\frac{\frac{e_{\text{I}}}{e_{\text{K}}}}{\frac{\hat{a}_{\text{I}}}{\hat{a}_{\text{K}}}}} \quad \text{и} \quad x_{\text{K}} = \frac{1}{\overline{x}} \times \sqrt{\frac{\frac{\hat{e}_{\text{I}}}{\hat{e}_{\text{K}}}}{\frac{\hat{a}_{\text{I}}}{\hat{a}_{\text{K}}}}}$$

Then reaching the maximum average annual growth rate of gross regional product can be found at the border of restrictions introduced into the model.

If X_{min} and X_{max} are smaller, $\hat{x} \times \sqrt{\frac{\hat{e}_{\text{I}} \div \hat{e}_{\text{K}}}{\hat{a}_{\text{I}} \div \hat{a}_{\text{K}}}}$, therefore, to determine the maximum growth rate of the gross regional product of the regions included in the analyzed system, we recommend relying on a less efficient region as the optimal rate, thereby setting the minimum limit at the level of X_{imin}, and calculate X * k as. $x_{\text{K}}{}^* = \frac{(\bar{x})^2}{x_{\text{min}}}$.

At the same time, it should be taken into account that cases in which Xk * > Xkmax are permissible. Then there is a need to correct the average annual growth rate of investments in fixed assets.

The optimal rate of investment growth in a particular region is calculated on the basis of $x_1{}^* = \frac{(\bar{x})^2}{x_{K\max}}$.

This model is applicable to other parameters and allows you to form a sample of indicators to substantiate investment decisions in individual cases.

The proposed approach contributes to the selection of the most optimal criteria for the equations for optimizing the target growth rate of investments in production capacities and resource potential of the region, the calculations can be based on the national chart of accounts and the parameters of the model.

The result obtained on the basis of comparison of these indicators becomes the basis of typologization of regions, on the basis of the above-mentioned criterion and contributes to the formation of analytical information on the investment potential of individual regions, the effectiveness of their investment policies, and the opportunities for sustainable economic growth in the long term. The resulting investment indicators are shown in Table 1.

The obtained result allows distinguishing parameters influencing investment resource recovery in the context of groups of regions, to rank them according to demographic profile, to identify factors having a significant impact on change of key macroeconomic indicators of the region. The advantages of the proposed approach are that the use of an integral indicator allows you to separate regions taking into account dynamic, rather than static factors.

4 Discussion

The typology of such a wide list of regions that are part of the Russian Federation is an issue that requires comprehensive analysis. specific grounds are needed. L. A. Kostygova notes that each individual region is interested in developing its own economic base, and therefore directs maximum efforts to attract investment in the region. The national objective is to use effectively the potential of each individual region for aggregate economic growth and long-term sustainable development. In order to make sound management decisions, it is necessary to rank regions, typology of them according to various characteristics, parameters and criteria.

Regions can be divided into groups on the basis of a wide range of indicators—economic, geographical and demographic, etc. Individual researchers—Leksin V. N., Shvetsov A. N., Andreev A. Yu., etc., propose a number of approaches to the classification of regions, and each author justifies the logic of his approach and the effectiveness of its application to solve specific socio-economic problems.

The approach of R. I. Schniper and A. S. Novoselov proposes a typology based on the parameters of industrial development, while the authors distinguish the specialization of regions in certain types of industry: agro, mining, mechanical engineering,

Table 1 Comparative characteristics of strategic priorities of investment development of groups of regions of the Russian Federation

Groups of regions	The entire regional economy						
	Index deflator Ip = 1143						
	Investment indicators						
	a	b	Xmin	δx	Yфакт	YL	R^2
Grouping by demographic profile							
1.1 DP 1	0.46	068	1.01	0.532	1.299	1.14	0.73
1.2 DP 2							
– Subgroup α	0.64	0.42	1.131	0.792	1.27	1.06	0.91
– Subgroup β	0.41	0.78	0.88	0.33	1.29	1.19	0.90
1.3 DP 3	0.25	0.94	0.82	0.29	1.27	1.19	0.71
1.4 DP 4							
– Subgroup «A»	No statistical link identified						
– Subgroup «B»	No statistical link identified						
– Subgroup «C»	0.25	0.9348	0.820	0.332	1.283	1.189	0.78
1.5 DP 5							
– Subgroup α	0.42	0.7483	0.931	0.399	1.286	1.172	0.78
– Subgroup β	0.58	0.494	1.126	0.744	1.273	1.070	0.93
Grouping by type of urban settlement							
2.1 type «A»	0.21	0.99	0.72	0.25	1.27	1.208	0.70
2.2 type «B»	0.17	1.03	0.64	0.22	1.26	1.21	0.73
2.3 type «C»	0.21	1.02	0.59	0.23	1.30	1.23	0.50
2.4 type «D»	0.39	0.76	0.97	0.44	1.28	1.16	0.67
Grouping by raw material profiles							
3.1 SP 1	0.82	0.27	1.06	0.684	1,30	1.10	0.76
3.2 SP 2	0.36	0.81	0.92	0.384	1.28	1.17	0.47*
3.3 SP 3	2.82	−2.03	1.13	1.01	1.21	0.79	0.97
3.4 SP 4	0.68	0.34	1.54	0.78	1.09	1.02	0.92
3.5 SP 5							
– Subgroup α	0.37	0.75	1.02	0.46	1.25	1.14	0.76
– Subgroup β	0.28	0.8513	1.057	0.477	1.243	1.127	0.93
3.6 SP 6	0.41	0.7176	1.026	0.478	1.253	1.132	0.77
3.7 SP 7							
– Subgroup α	0.10	0.75	1.011	0.344	1.221	1.145	0.71
– Subgroup β	0.37	0.73	1.111	0.538	1.221	1.102	0.81
3.8 SP 8							
– Subgroup α	0.86	0.12	1.20	1.00	1.24	0.93	0.86
– Subgroup β	0.19	0.98	0.84	0.33	1.26	1.17	0.97
3.9 SP 9	0.41	0.71	1.06	0.52	1.25	1.19	0.66

Source Ignatiev V. G. Structural and investment types of regions and features of regional economic dynamics (2005)

petrol-chemistry, etc. Attention is paid to underdeveloped regions where there is stagnation in the development of industry, the authors attribute such regions to problematic ones, and note various factors whose influence can serve as a basis for assigning regions to the above types (Safiullin et al. 2013).

V. A. Andreev in his graduation of regions identifies qualitative complex characteristics of regions from economic, to climatic and geographical, highlighting them as parameters of the region's investment attractiveness. Classification of this author includes: "advanced" regions (Moscow, St. Petersburg, Kaliningrad region) remote regions (with extreme weather conditions)—Eastern Siberia, Far East; "conservative" regions (North Caucasus, Volga region, Volga-Vyatka, Northwest, Central, Central Chernozem districts), perspective territories [Urals and Western Siberia (Strezhkova and Strezhkova 2020)]. This typology is not devoid of shortcomings, but is interesting for a complex approach and parametric characteristics.

In the work of A. Samokhvalov, the criteria for classification are economic areas, natural and climatic conditions, sectoral specialization, the importance of regions for the federal budget, the status of national-territorial entities, the level of budget income per capita (Trukhachev et al. 2020). The author approaches the issue of ranking regions narrowly, leaving a wide field for research.

In domestic and foreign sources, you can find many other publications and works devoted to the mechanisms of typology of regions with a simplified approach to choosing a classification criterion. In most cases, the criterion is focused exclusively on one of the aspects of research—economic, sociological, demographic, forensic and many others. This study sets out the tasks of enriching mathematical tools for determining the parameters of the typology of regions and identifying factors that make it possible to increase the investment attractiveness of individual regions for general sustainable growth and development of the state.

5 Conclusion

A theoretical and methodological tool for comparative analysis has been developed. Regions are grouped by type of urban settlement, demographic and commodity profile.

Regional features of the system of strategic priorities of economic development of various structural types of investments are highlighted.

The impact of the average annual investment on the growth rate of fixed assets on the final characteristics of the region's economy was analyzed.

Implementation at the federal and regional levels of the proposed approach, corresponding methodology and algorithm of comparative interregional investment analysis can contribute to more active mobilization of available resources of the Russian regions and their more effective use.

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Realities of Financial Independence of Regions

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Abstract The formation and effective use of financial resources in the budgetary sphere is complicated by conditions characterized not only by an unforeseen deterioration in the economic situation, but also by the high uncertainty of the future dynamics of the factors affecting it. The purpose of this work was to assess the financial condition of the Russian regions in the context of the pandemic and to find opportunities for further development. Methods used in the research are: analysis and synthesis, induction and deduction, logical and historical method, scientific abstraction and statistical comparisons. The article studies the dynamics and structure of revenues and expenditures of the budgets of the constituent entities of the Russian Federation. The analysis becomes in a section of the consolidated budgets of territorial subjects of the Russian Federation. On the basis of forecast models, a tendency to reduce income and expenses of the regions in the medium term has been revealed and the problem of financial independence of the constituent entities of the Russian Federation is increasing. The shift of emphasis in the structure of federal transfers to the budgets of the constituent entities of the Russian Federation and the transition from non-targeted forms of support for regional budgets to targeted ones with an orientation on federal programs and projects are demonstrated. The dangers of transfer dependence of regional budgets have been identified. The directions of further development of inter-budget relations are systematized with an emphasis on increasing the size of inter-budget transfers and strengthening the tax autonomy of the regions. The originality and practical significance of the study is determined by the tools for ensuring sustainable economic growth, including the balance and fiscal sustainability of the region. The results of the study can be proposed for the development of priority areas of sub-federal fiscal policy, focusing on the formation of potential tax capabilities of the territories.

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Keywords Financial flows · Budget deficit · Budgetary security · Financial independence · Transfer dependence · Income · Expenses

JEL Codes H720 · H770

1 Introduction

The state of the financial and budgetary system of Russia is determined in the current conditions by a number of significant threats to the economic security of the Russian Federation associated with the continuation of the COVID pandemic in 2021 and the increased danger of similar threats; with a decrease in the trade balance, preservation of the overall reduced level of well-being of the population of the Russian Federation, a weak influx of public funds into the financial and credit system, respectively, insufficient resources for investment (Shevchenko 2019; Vylkova et al. 2020).

To combat the effects of corona-virus, anti-crisis programs are provided that are designed to support the most vulnerable categories of citizens affected by industries.

2 Methodology

Theoretical studies of fiscal federalism point to the dangers of transfer dependence, considering it as a set of soft budget restrictions that allow regions to shift their financial problems and the cost of financing expenses to the rest of the world. Transfer dependence can cause atrophy of regional tax potential and thereby make the region vulnerable to negative external shocks and speculative attacks on its debt (Alyokhin 2020).

Problems of assessment of stability of regional budgets, efficiency of instruments of management of their income, increases in independence of regions are engaged many economists, in particular, in Nesterenko in (2019), Bukhara and Lavrov (2020), Melamedov (2002), Oleynikova (1997), Kirilova (2019), Medvedev et al. (2020), Muravleva (2020), Shevchenko (2019), Tyurina (2020), and others.

According to the authors of this article, despite the significant financial flows going to the regions in the form of support for the region, the problem of financial independence is not only not reduced, but is further intensified. The concentration of production of goods and services in certain regions of the country remains high. Against this background, the gap in the development of different territories continues to be high. The gap in budgetary provision between the 10 richest and 10 poorest regions in 2017 is 6.9 times up to the equalization of budgetary provision, with a reduction to 3.1 times after the distribution of subsidies.

3 Results

The economic crisis caused by the pandemic of corona-virus infection has led to a significant gap between budget revenues and the expenditure obligations of the regions. In 2020, regional budgets are projected to deficit 0.9% of GDP, which is the maximum deficit since 2013. Measures to rebuild the economy and address the impact of the pandemic are expected to lead to a phased reduction of the budget deficit over the next three years. Revenues and expenditures of consolidated budgets in 2021–2023 will be in the range of 12–13% of GDP, reducing monotonously during the period under review (Fig. 1). The stable level of tax and non-tax revenues of the regions in relation to GDP will be maintained through additional support measures, which will contribute to an increase in own budget revenues.

In 2022–2023, it is planned to annually increase the growth rate of expenditures of consolidated budgets of entities, taking into account the implementation of national projects, the implementation of the "May decrees" of the President of the Russian Federation and additional social support measures announced in 2020 in connection with the pandemic. However, reducing the share of regional budgets in GDP and minimizing the budget deficit is possible only if there is economic growth ahead of the growth rate of spending obligations. Otherwise, the gap between expenditures and revenues of sub-federal budgets in 2022–2023 is likely to be higher than predicted.

Inter-budget transfers in the form of subsidies are planned for 2021—0.9%, in 2022—0.8% and 2023—0.7% of GDP.

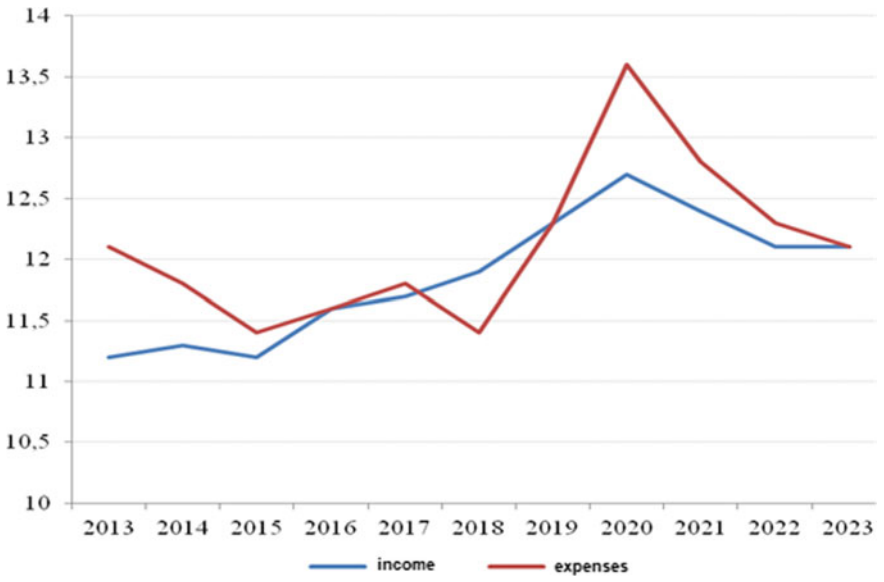

Fig. 1 Dynamics of income and expenditure of regional budgets, % to GDP. *Source* Compiled and built by the authors

However, despite the obvious manifestation of the consequences of the particularly difficult financial situation in 2020 and the need for its compensation in the future, according to the budget indicators for 2021–2023 there is a decrease in the volume of financing of inter-budget transfers in 2021 by 18% compared to 2020. At the same time, transfers of a general nature will decrease in 2021 and 2022 by 7.1% and 8.8%, respectively, and in 2023 they are projected to grow extremely slightly (by 1.6%). In fact, we are talking about a decrease in the amount of financing for this category of inter-budget transfers compared to the pre-crisis 2019 by 1.3% or by 12.7 billion rubles. Given the fact that the economy of a number of regions was extremely seriously affected during the current economic crisis, the budgets of many constituent entities of the Russian Federation will experience serious difficulties in financing the necessary expenses.

Within the framework of the planned period, a pronounced shift of emphasis in the structure of federal transfers to the budgets of the constituent entities of the Russian Federation is seen. If until now the main role in their structure belonged to transfers of a general nature (subsidies), then, starting from 2021, the amount of subsidies will exceed the amount of subsidies. Accordingly, the share of subsidies will decrease from 38% in 2019 and 34% in 2020 (according to estimates) to 31.5% in 2021 (the minimum for the period 2015–2023) and 32–33% in the subsequent years of the three-year period.

At the same time, in 2021 it is planned to completely reduce subsidies compared to 2020 by 32.0 billion rubles and in 2021 by another 10.3 billion rubles. And only their pronounced growth in 2023 (which may be revised twice more with the process of adopting the budgets of next years) will help to recoup this decline.

The amount of subventions granted after a marked increase in the current crisis year (by 48.6%) in the next 3 years (within the entire planning period) remains virtually at the same level. It is not supposed to index the various components of this block of federal spending even to the projected inflation rates. It should be noted that a number of projects and programs, including those related to health care and social support measures for the least protected segments of the population, are being financed under this transfer block. For example, provision of medicines and medical products for children with disabilities, measures of social support for citizens exposed to radiation, etc.

The scale of inappropriate federal support for the budgets of the constituent entities of the Russian Federation within the framework of the planned three-year period is actually recorded at a level below 2019. Including subsidies for leveling the level of budgetary provision increase by 6.3% compared to 2019.

In general, there is a pronounced transition from non-targeted forms of support for the budgets of the constituent entities of the Russian Federation to targeted ones with an orientation towards federal programs and projects. The capabilities of the constituent entities of the Russian Federation to implement their own priorities are limited by their coincidence with federal programs and federal tasks.

With one of the highest regional differentiations in the world in terms of development and budgetary security, the cost of leveling it in Russia is much lower than in a number of developed and developing countries. Before the crisis, OECD countries on

Table 1 Revenues of consolidated regional budgets, in% of GDP

	2019	2020	2021	2022	2023
Revenues, total	12.33	12.74	12.42	12.10	12.06
Tax and non-tax revenues	9.99	9.50	9.95	9.88	9.89
Inter-budget transfers from the federal budget	2.17	3.24	2.47	2.22	2.17
Income less subventions	11.97	12.19	11.91	11.65	11.63
Expenses, total	12.33	13.57	12.78	12.28	12.08

Source The main directions of the budget, tax and customs-tariff policy for 2021 and for the planning period 2022 and 2023

average spent 2.5% of GDP on these purposes, 50% of the total transfers transferred to the regions and 5% of the expanded budget. In Russia, only 0.6% of GDP (1.7% of the Russian expanded budget) was spent on fiscal equalization in 2019. In order for the Russian regions to successfully develop and fulfill their budgetary functions, and not to be in constantly growing dependence on the federal center, in the medium term it is necessary to gradually increase their financial support.

Reduction of real volume of transfers in 2021–2023 will lead to reduction of real volume of revenues of consolidated regional budgets (Table 1).

This entails risks for the balance and debt sustainability of regional and local budgets. It is on this problem that the attention of Yakunin and Semernin [15 focus; 294]. In addition, this may further strengthen the differentiation of the level of budgetary security of the regions, despite the fact that among countries with a federal state structure it is one of the highest.

Therefore, we consider it necessary to increase the size of inter-budget transfers for 2021 and beyond to at least 3 trillion rubles per year.

The main areas of further development of inter-budget relations may be as follows:

- increasing the income base and tax independence of regions and municipalities (abolition of federal benefits on regional and local taxes, refusal to regulate the tax system of the Russian Federation maximum rates on regional and local taxes);
- reduction of a share of target transfers to regions at simultaneous increase in flexibility of regions in their use (through reduction of quantity and volume of separate subsidies in favor of block grants, reduction of volume of other inter-budgetary transfers).

In the field of regional income, the centralization of tax revenues continues: in 2019, out of 31,108.5 billion tax and non-tax revenues of the consolidated budget of the Russian Federation, 64.7% went to the federal budget, and 35.3% to the consolidated budgets of the constituent entities of the Russian Federation. In the total amount of revenues to the consolidated budget of the Russian Federation in 2019, the share of revenues to the federal budget amounted to 55%, to the consolidated budgets of the constituent entities of the Russian Federation—45%. While in a federal state, the subjects of the federation should have elements of independence and ideally, the federal level can account for no more than half of the income.

The share of tax revenues, the rate and base of which was completely or partially regulated at the subnational level, in Russia in 2013 amounted to 50.8%, that is, on average in OECD countries—77.6% (for regions) (Lavrov 2019).

4 Conclusions

In the Russian situation, obviously, the principles of fiscal federalism are violated. The independence of the territories is ensured precisely by the presence of its own tax revenues, which, in turn, allows for an effective spending policy. Moreover, financial independence plays the greatest role in countries with a high level of territorial differences. Conversely, targeted transfers from higher budgets deprive any freedom in determining the choice of priority areas for the use of budget funds. Moreover, the budget independently increases the responsibility of the authorities, forms more balanced decisions and increases transparency and democracy. It is the presence of their own sources of income in the regions that is the stimulating factor in increasing tax collection and managing tax bases and potential, and therefore an increase in income in the country as a whole can be ensured.

The situation is aggravated by the lack of sufficient own taxes from regions and municipalities. Budget-forming taxes for the budgets of the constituent entities of the Russian Federation are federal taxes: income tax of organizations, personal income tax, excises taxes. The norms for the distribution of these taxes between the budgets of the budget system of the Russian Federation according to budget legislation are credited to the budgets of the constituent entities of the Russian Federation. These are actually so-called fissile taxes, which, by the nature of the deductions and the manner in which they are established, are divided into permanent and temporary (Ermakova and Troyanskaya 2015). The system of fissionable taxes, as well as inter-budget transfers, on the one hand, is aimed at supporting regional budgets, but they lack incentives to effectively use budget funds and build their own tax capacity. Therefore, we deem appropriate approach “one tax—one budgetary level” (Lavrov 2019).

The modern direction of the development of the Russian model of budget federalism may be to strengthen the tax autonomy of the regions.

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Cognitive Modelling of Evolution of Regional Food Security Indicators in Import Substitution

Aleksey F. Rogachev and Olga B. Mizyakina

Abstract The purpose of the research is to develop and computer implementation of methods of data mining based on cognitive modeling, obtained as a result of matrix modeling and assessment of the level of food security (FS) in conditions of forced import substitution and increased food exports. As the basic methodology for obtaining an objective assessment of the FS level, a systemic approach was used, as well as separate methods of analysis and structural synthesis of elements of the modeling system. The identification of specific differences of the updated FS Doctrine (2020) was carried out using the method of comparative research. Fuzzy cognitive maps (FCMs) were used as a basic modeling tool. The construction of the graph structure, relationships and weights of the FCM was carried out by means of a previously formed system of indicators. It has been shown that to solve the problem of objective assessment of the FS level, it is advisable to use computer modeling based on fuzzy production cognitive maps. The advisability of integral consideration of key groups of factors is justified: food production, consumption, as well as the share of imports and the rational amount of food reserves in conditions of forced import substitution. The directions of computer system modernization and improvement of mining methods for level prediction are presented. An example of FCM and a diagram of the evolution of the FS support system in pandemic conditions are given.

Keywords Food security · Fuzzy · Matrix cognitive models · Import substitution

JEL Codes Q01 · Q13

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1 Introduction

Food Security (FS) of the Russian Federation is regulated by the "FS Doctrine," of January 21, 2020 and adopted to replace the previous one from 2010. In the work of a number of foreign economists specializing in the provision of FS, the latter is determined by the following factors: supply of food resources, disposable incomes of the population, availability of food supplies for consumers. As you might know, even with the intensification of agricultural production, the possibility of increasing food production is limited. In the long term, it will be necessary to adjust food production to the levels that provide for the entire population of the Earth.

The analysis of research in the field of FS made it possible to put forward a scientific hypothesis suggesting the possibility of an objective assessment of the integral indicator of FS level by cognitive modeling based on the mathematical apparatus of the matrix impulse analysis of the evolution of NCC indicators (Rogachev et al. 2018), it is shown that cognitive maps can provide effective modeling of basic spheres of FS formation with obtaining a generalized integral evaluation. Mathematical modeling and prediction of the evolution of FS in the conditions of multiple problem factors, their intersectoral nature and a significant number of groups of input indicators is very cumbersome. Note that when evaluating FS, not all factors are clearly and strictly defined, the forces and directions of their relationship are often characterized indirectly.

To solve the identified problem of taking into account a significant number of difficult to formalize factors, the development of new ones or the modernization and adaptation of known methods for building fuzzy mathematical models is required. This can be done, for example, by building production FCMs. The methods of fuzzy cognitive modeling mining carried out to predict the FS level in the conditions of the task of increasing exports and forced import substitution require improvement and updating.

2 Materials and Method

The results of the analysis and implications of the regulation of the agricultural sector providing the production of raw materials and food, as well as the management of their system of assurance and quality of products in the USA, Canada and EU countries are given in the publications of foreign scientists Capone et al. (2014), Herforth (2015), Weikard (2016).

The problematic issues and implications of the State's food policy framework for achieving FS levels are described by Altukhov (2016), Antamoshkina et al. (2016), Petrikov (2018), Shik et al. (2020). Various aspects of food security are presented in Ulezko (2014), Yarkova et al. (2013).

Individual studies of the achievement of the required FS of the state are focused on the identification and assessment of relevant factors for its provision. In the publications of Ginis et al. (2016), Shagayda et al. (2016), the level of FS is linked to the resource security, as well as the safety of the natural and man-made environment of agricultural production.

The present study used common approaches and methods within the framework of the FS assessment system methodology, as well as specific methods of analysis and synthesis of the modeling system. Identification of the specifics of the content of the updated FS Doctrine was carried out using a comparative analysis method. In order to substantiate the system of indicators and key factors of FS, it is advisable to use the expert "Hierarchy analysis method" (HAM). Fuzzy cognitive maps (FCMs) were used as modeling tools. The FCM structure, links and weights are built on the basis of the generated system of indicators.

To build the software complex under development, which ensures the implementation of pulse matrix modeling procedures for FS software systems described by means of contiguity matrices, as well as debugging and testing of the software prototype, a technique was developed that additionally includes adjusting the weights of interaction of concepts created by FCM.

Scenario analysis of the state and evolution of the FS level of the simulated socio-economic system was carried out using computer support tools.

3 Results

In the system of ensuring economic security, the important tasks are ensuring and objective assessment of the required state of FS. This is due to the fact that without reliable supply of affordable and high-quality food according to scientifically sound standards, the state is not able to avoid food dependence. A critical analysis of scientific publications in the field of cognitive modeling of FS indicators previously selected within the subject area revealed the need for further improvement of the scientific and methodological basis for further research. It is necessary to modernize and improve the algorithmic basis of software and hardware procedures for computer support for monitoring, obtaining state estimates and predicting the FS level. This is especially relevant in the conditions of forced import substitution in the conditions of sanctions by other states.

The ever-increasing interest in applied problems of numerical estimation and scientific methods of reliable prediction of the FS level leads to the creation of new and modernization of existing approaches to the construction and parameterization of fuzzy cognitive models. Note that a significant number of known mathematical models describing FS are focused on particular aspects of the problem being solved. Not always sufficient objectivity of the results obtained when using them is associated with a low degree of formalization due to the expert-subjective and narrative nature of the estimates obtained.

Previously developed and known mathematical models of FS, oriented to obtaining forecasts with different horizons, are oriented to simulation modeling with obtaining quantitative or qualitative estimates of different macroeconomic parameters of FS level (Svetlov 2019).

Let us consider the known mathematical models of FS in more detail. The EPACIS model implements processes of partial equilibrium state of agricultural markets. This model, aimed at CIS countries, attaches great importance to foreign trade relations. The mathematical model of BLS, based on the well-known LPP, describes both the strategic goals of players in market conditions and the constraints of the condition of a formulated problem belonging to the class of mathematical programming. Unlike the static previous model, the Aglink dynamic model recursively describes equilibrium conditions that take into account both individual states and macroregions.

The classic mathematical and statistical approach to assessing the effectiveness of food policies pursued by the state is based on the IAFP—(Index of Agrarian and Food Policy) integrated performance index, which is additive formed to aggregate the corresponding indicators that take into account both financial and economic and sociotechnical indicators.

The diversity of aspects of providing FS further complicates the task of objectively assessing its state and trends in evolution. In addition, the influence of global negative factors—pandemics, climate change, natural disasters also has a significant impact on the level of FS. The Covid-19 pandemic, which swept civilization in 2020, clearly demonstrated the need, when analyzing FS, to record stocks and supply medicines. The listed quantitative and qualitative aspects of providing and evaluating FS increase the dimension and complicate the task of economic and mathematical modeling of the FS level.

An analytical review of patent and information publications revealed the need to improve both theoretical and methodological approaches and software and hardware for computer support for monitoring, evaluating and predicting the integral value of the integral indicator of the FS level. This is especially relevant in conditions of forced import substitution, based on classical (sign) or fuzzy cognitive maps.

The current state of the methodology for constructing and researching specialized subject-oriented information systems (IS), including those based on the use of fuzzy cognitive maps (FCM), is presented in the works of scientists such as Avdeeva (2007), Gorelova et al. (2016), Klimenko (2018), Kornoushenko (2016).

A network of cause and effect relationships in the form of a weighted orgraph formalized by FCM, in a generalized form can be displayed by a tuple

$$G = (C, W), \tag{1}$$

where C—a plurality of FCM concepts corresponding to selected key factors of the simulated FS system;

W—many weights of mutual influences between factors, where elements.

$$w(i, j) = F(c_i, c_j) \in W \to [-1, 1] \tag{2}$$

Using pre-formed FCMs, the elements of the incompatibility matrix A characterizing the mutual influence of concepts among themselves are specified with expertise. This allows you to investigate the resulting model according to the criteria of the current state, possible behavior and the deTgree of stability of the simulated system.

Analysis of the comparison of sign (classical) and fuzzy cognitive maps confirms the feasibility of using FCM to analyze complex multifactor systems, which should also include FS provision systems.

Common and widely used by various researchers' mathematical apparatus of impulse cognitive modeling combines the following methods of estimation of both self-development of the investigated system and its controlled development under the influence of control perturbations (Rogachev et al. 2017).

1. Self-development of a system modeled by a given structure.

The free evolution of the state x (t) of the model of the studied system is described by the matrix equation:

$$x(t) = (I + A + A^2 + \cdots + A^{\mathrm{n}})x(o) \tag{3}$$

where I—unit matrix of size n x n;

A—An adjacent matrix of a simulated system having a size of n x n;

x(o)—vector of the initial state of the simulated system.

2. Controlled evolution of states of the simulated system is complemented by impulse action:

$$v(t+1) = P(0) \cdot A^n \tag{4}$$

where P (0)—control pulse acting on concepts of the simulated system;

A—adjacent matrix of size n × n.

Dependencies (3), (4) are also used to calculate the main system indicators of the modeling FCM, which include consonances and dissonances. The calculation of the above indicators characterizing the mutual influence of FCM concepts, both directly and indirectly, is based on the analysis of the configuration of concept communication paths. Various criteria are used for the numerical assessment of such influence, in particular conformity, balance, as well as the strength of the oriented influence.

In order to implement computer support for the FCM parameterization procedure, verification and numerical modeling, as well as a scenario analysis of the evolution of the FS software system, a software complex based on the Strategist program was used. The complex contained a knowledge base, modules for specifying the functions of belonging to concepts and a means of working with the database of statistical retrospective indicators of the simulated system. In order to perform the scenario analysis, the system was configured to assess the state and predict the evolution of the received FS integral level indicator (Fig. 1a).

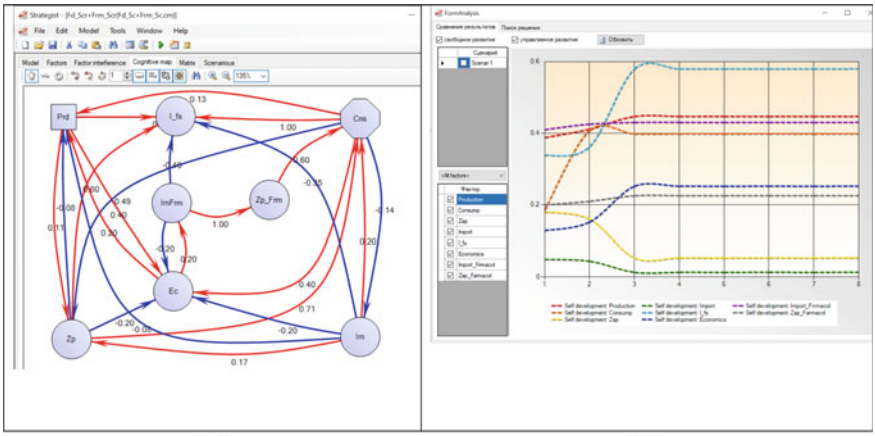

Fig. 1 Modeling the evolution of indicators of the FS support system, taking into account the availability of medicines: **a** FCM of the regional economic system; **b** dynamics of evolution of concepts of the simulated system. *Source* complied by the authors

The NCC was parameterized using an information model, using selected statistical indicators.

An example of an NCC modelling the evolution of indicators of a regional socio-economic supply-based FS system is shown in Fig. 1.

With the aim of more in-depth research on the behaviour of the simulated FS delivery system, along with traditionally considered factors (production, consumption, stocks and imports of food), concepts that take into account the availability of medicines were additionally introduced into the FCM model. The latter are also largely oriented towards import, procurement and storage, while placing an additional burden on the regional economic system (Nizhegorodtsev 2016). According to the authors, the presence of such a component in the structure of import purchases, as shown by anti-epidemic measures resulting from the fight against the COVID-19 pandemic, has a negative impact on the value of the integral indicator FS. A corresponding negative impact relationship is included in the FCM of the modified model.

The diagrams in Fig. 1 show the processes of reducing food stocks while reducing drug stocks with a moderate increase in the epidemiological threat, as well as their impact on the economy as a whole. Scenario analysis using modern IT (Mizyakina 2017) allows you to model other outcomes of the situation, including forced reduction of imports. For the simulated system of concepts and weights of their mutual influence (Fig. 1a), the integral FS level indicator maintains growth with almost unchanged food imports.

4 Conclusion

Therefore, the research made it possible to justify the use of a fuzzy cognitive approach to assess the level of FS, including in a managed development regime, as well as to formulate a set of private subtasks, including the possibility of introducing functional relationships between NCC concepts, the solution of which allows you to create and adapt a computerized information and analytical system to assess the level of FS.

The implementation of the formulated private tasks allows to obtain an objective numerical assessment of the integral level of FS, obtained on the basis of fuzzy cognitive modeling, as well as to predict the dynamics of the evolution of the simulated system, including taking into account the control effects carried out by government agencies, in order to implement agro-food policy.

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Features of Ensuring the Economic Security of the Regions of the Russian Federation

Alexander E. Suglobov, Anna K. Morozova, Anton Y. Morozov, and Alla L. Dyhova

Abstract This article deals with the problem of ensuring the economic security of the regions of the Russian Federation at the present stage. The methodological and practical features of its solution are highlighted. The role and place of regions in the overall system of national and economic security of Russia is substantiated, the key concepts of security in relation to regions are clarified and the main threats and challenges are considered. The results of the study showed that the Russian Federation has a complex federal structure. The territory of Russia is territorially divided into 8 federal districts. All regions have distinctive features in terms of geographical location, length of territories, population size and density, availability of natural resources on the territory, level of development of productive forces, proximity of borders with other countries, etc. These features are the main factors that determine the socio-economic situation of the regions, the level of their economic security, the nature of external and internal threats. Within the framework of the state regional policy, territories of advanced social and economic development are being created. These entities are provided with a special legal status and economic benefits (tax, customs, concessional lending, etc.) to attract domestic and foreign investors, accelerate economic development and improve the life of the population. There are 26 special economic zones and 28 priority development territories have been created and are functioning effectively in Russia. The basic principles of the state regional policy are also taken into account in the development of national projects and other regulatory instruments.

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Keywords Economic security · Region · Threats and challenges · Assessment methods · Indicators · Thresholds · State regional policies · Special economic zones · Priority development territories · National projects · Targeted programs

JEL Codes F52 · H56 · O18 · P25

1 Introduction

In the modern world, global threats and challenges to the entire world community, individual countries and regions in the field of geopolitics, economics, technology, ecology and the social sphere are constantly increasing and changing. This significantly exacerbates and updates the problem of ensuring the national and economic security of the Russian Federal Federation.

Economic security is a complex and multifaceted category that includes such key concepts as objects, entities, threats, indicators, strategic directions, mechanisms, etc. Each of those concepts required scientific and practical elaboration in order to form an effective system for managing the economic security of the State as a whole and of each individual object (President of the Russian Federation 2021).

2 Materials and Methods

The Concept and Strategy of Economic Security of the Russian Federation defines the main objects of its support, which are: state, region (industry), enterprise, person (Bautin et al. 2018). All objects are closely related and interdependent. The fact that the economic well-being of each of these facilities had a beneficial impact on the economic security of other entities would not be proven. At the same time, for a country such as Russia, with its vast territories, geographical diversity, multiethnic population with centuries-old traditions, a very difficult federal structure and other differences, the problem of ensuring the economic security of regions required special attention. The issue should be considered in two aspects: methodological and practical.

The methodological aspect involves the study of the essence of the basic categories of economic security (threats, challenges, risks, tools, methods and indicators for assessing the level, etc.) in relation to regions, as an independent object of economic security, taking into account its objective and subjective characteristics and other specific features (Bank et al. 2018; Bessonova et al. 2017; Orlova et al. 2020).

The practical aspect of the problem is a study of the existing socio-economic situation of the regions, an assessment of the level of economic security, monitoring of existing external and internal threats, their ranking by the degree of importance, the

development of regional economic security strategies, determining their effectiveness, etc. (Bessonova et al. 2018; Golubev et al. 2019; Vlasenko and Shedko 2015; Zhahov et al. 2019).

The key term of this problem is the region with which to define the concept, first of all. In the Russian Federation, the official definition of "region" is not established at the legislative level. Therefore, in the scientific environment there are many definitions that differ significantly among themselves, depending on the scientific field in which the concept of the region is considered: geographical, political, socio-economic, environmental, information. In our study, we were guided by the most acceptable, in our opinion, definition of the region, as close as possible to the administrative structure of the Russian Federation and the problem of economic security.

The region is part of the territory of the Russian Federation with the same or similar natural, socio-economic, national-cultural and other features, representing a separate territorial-economic complex, which is part of the country's general economic system.

3 Results

The Russian Federation has a complex federal structure. The territory of Russia on a territorial basis is divided into 8 federal districts. Each of the subjects has distinctive features in terms of geographical location, length of territories, size and density of the population, presence of natural wealth on the territory, level of development of productive forces, proximity of borders with other countries, etc. These features are the main factors determining the socio-economic situation of the regions, the level of their economic security, the nature of external and internal threats.

External threats to the economic security of regions, which are formed at the global and federal levels, as well as from neighboring states, at the present stage should include:

- The global economic crisis associated with the effects of the coronavirus pandemic on a global scale, resulting in a sharp drop in production, increased unemployment, a decline in the standard of living of the population, and uncontrolled migration flows;
- Trade and information wars, sanctions by unfriendly states, which undermine the previously established economic ties between countries and regions, impede the flow of foreign investment into the economy of Russian regions, and block access to modern technologies;
- Territorial claims of some neighboring States threatening the territorial integrity of Russia and damaging the socio-economic climate in the border regions;
- Aggravation of unfair competition in the global energy market, manifested in the deliberate collapse of world oil and gas prices, open opposition to the development

of the Russian oil and gas infrastructure. These threats are especially felt by the regions of Russia, focused mainly on the extractive sectors of the economy.

The main internal threats to the economic security of the regions at the present stage are:

- Insufficiently balanced economic structure of the region, the bet on one, mainly, raw material industry, which makes the region's economy completely dependent on this industry and very vulnerable in conditions of unfavourable development of the situation, unforeseen threats and challenges in this industry;
- Ineffective management of the region, insufficient attention to social problems, infrastructure development, transport accessibility, health care and other needs of the population, which is accompanied by the most adverse consequences—a decrease in the quality of life and the outflow of labor resources to other more prosperous regions, and often countries;
- The high level of deterioration of production funds, insufficient investment in their reproduction and modernization, which leads to technological and environmental disasters, causing serious damage to the productive potential of the region, regional, and often federal budgets, and the natural environment.
- Insufficiently justified and inefficiently implemented regional investment policy, as a result of which the investment and innovative activity of the region decreases, its investment attractiveness decreases, the pace of socio-economic development slows down.

There are a number of other specific features and threats that impede the sustainable situation and sustained socio-economic development of the regions.

In the economic security system of the regions, the methodology for assessing its actual level at the time of the study is central, without which it is impossible to assess the current situation, identify risks and threats, as well as determine further development paths. The multifaceted and complex nature of the economic security category necessitates a multivariable approach to its assessment, that is, the use of different assessment methods, depending on the internal factors and specific characteristics of a particular region.

In economic science and practice, there are various methods for assessing the economic security of regions, among which, in our opinion, the most practical are:

1. The method of comparison with the all-Russian values of the main indicators. This method allows you to assess how much regional indicators differ from all-Russian indicators. The results are a starting point for the development of a regional strategic development program;
2. Method of comparison with reference region. This method can be used both for a single region and for several regions, in order to rank them by the level of economic security. In case of ranking, the reference region is determined for each indicator separately; the ratio of each region to the reference one is calculated. According to the sum of the coefficients obtained, a ranked number of regions are built according to the level of economic security.

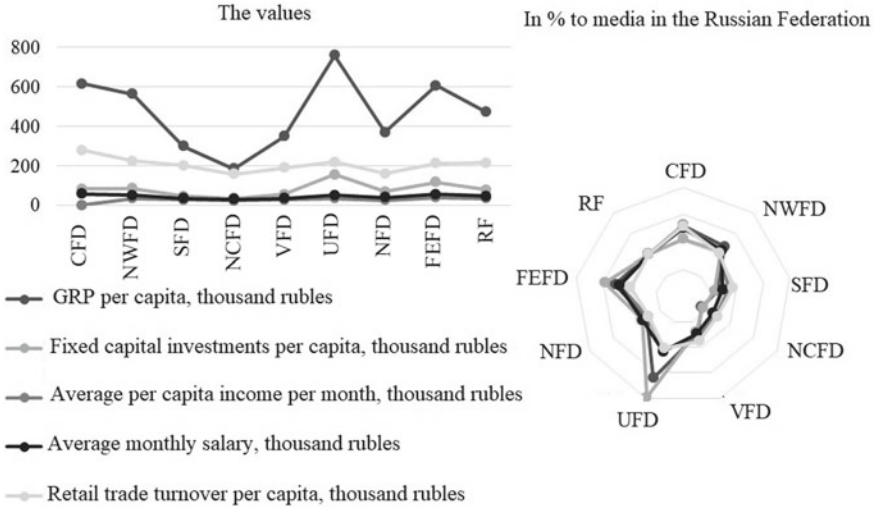

Fig. 1 Assessment of the economic security of regions by comparing regional indicators with the average for Russia. *Source* Calculated and built by the authors

3. Economic and mathematical methods that allow you to not only measure the achieved level of economic security on a large mass of information material using a mathematical apparatus, but also to compile predictive models for the further socio-economic development of regions.

In order to comprehensively characterize the economic security of the region, there are many indicators of a productive, socio-economic, financial, environmental nature. An important point in this regard is the selection of the optimal number of indicators that are most relevant to the goals and objectives of the forthcoming study.

We have carried out calculations for the federal districts of the Russian Federation based on the official statistics of Rosstat for 2018 in order to experimentally test individual assessment methods. The results are shown in Figs. 1 and 2.

According to the figures given, the economic security of the regions according to the analyzed indicators differs significantly, while two enlarged groups of regions are clearly distinguished. In 4 federal districts of the Russian Federation (Central, North-Western, Ural, Far Eastern), all indicators exceed all-Russian indicators. These are usually regions with traditionally developed industry, agriculture, infrastructure and large labor resources. They belong to the so-called donor regions, whose transfers to the budget exceed budget revenues.

In other federal districts (Southern, North Caucasus, Volga, Siberian), all indicators are lower than the average values in Russia, and, for some indicators, deviations are very significant.

This method gives a general idea of the provisions of the regions in relation to the average indicators in Russia. A more detailed picture is given by the comparison method with the reference region.

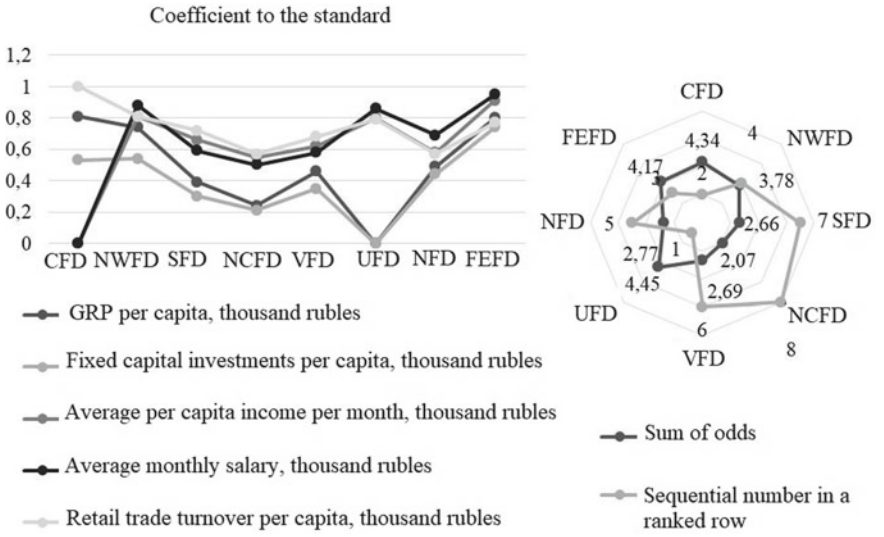

Fig. 2 Ranking of the regions of the Russian Federation by the level of economic security by comparison with the reference region. *Source* Calculated and constructed by the authors

Calculations showed that in the ranked number in terms of economic security, the Ural Federal District takes first place, the Central, and the Far Eastern. The ranked number of Southern and North Caucasian federal districts is closed.

The uneven socio-economic development of the regions is a significant problem that needs to be solved at both the regional and federal levels. "The most important conditions for its solution are: the availability in the regions of the necessary resources (financial, material, information, energy, labor, etc.); a rationally organized regional management system; availability of necessary information, technical, financial, legal and other types of security; the existence of an effective system of state regulation of the economic activities of the regions; effective migration policies; effective anti-corruption policy in the region" (Golubev et al. 2019).

At the federal level, the solution to the problem is carried out primarily through State regional policies aimed at equalizing the socio-economic development of the constituent entities of the Russian Federation and improving the standard of living of the population living in their territories.

4 Conclusion

The system of state regulation includes: continuous monitoring and analysis of regional development information; determining the place of each region in the common economic space of the Russian Federation; setting priorities and targets for

regional development; Identification of constraints to the implementation of State regional policies; forecasting the development of regions for the future.

Within the framework of State regional policy, special economic zones (industrial, innovative, port, tourist) are being created on the territory of the Russian Federation, as well as territories of advanced socio-economic development. These entities are given special legal status and economic benefits (tax, customs, preferential lending, etc.) to attract domestic and foreign investors, accelerate the development of the economy and improve the life of the population. Currently, 26 special economic zones have been created and are effectively functioning on the territory of Russia (mainly in the Far Eastern region, Crimea, Kaliningrad region) and 28 territories of advanced development (not counting single-industry towns and closed administrative formations), mainly in Siberia and the Far East.

The basic principles of state regional policy are also taken into account in the development of national projects, federal and local targeted programs, federal funds for regional development and other instruments for regulating the socio-economic development of regions.

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Land Control in the System of Sustainable Development of Municipalities

Mikhail V. Demidov, Elena V. Ivanova, Nadezhda V. Semenova, Inna N. Skuratova, and Vera P. Filippova

Abstract Issues of land management and control are always the focus of attention of representatives of the legislative sphere, state and municipal administration, citizens and legal entities. Meanwhile, it is important to consider these issues when organizing territories, as well as implementing the principles of sustainable development. The purpose of the work is a systematic analysis of municipal and public control. The authors identified legal and organizational problems in the organization of control in the field of land use and the protection of the rights and interests of subjects of land relations. The problematic aspects of the legal regulation of the institute of land control were studied. An analysis of the state of municipal and public land control at the regional level was carried out. Positive experience of public participation in land use issues in foreign countries is presented. The results indicate the need to find a balance between the activities of state land supervision bodies, municipal land control and representatives of the population, taking into account local conditions.

Keywords Land use · Municipal lands · Municipal land control · Public land control · Sustainable development of territories

Jel Codes Q 15

1 Introduction

Land resources play an important role in shaping the sustainable development of territories. Land is an important potential of the municipality, which is a natural resource and the basis for planning and development of territories (Sayer et al. 2016). Sustainable and effective land management requires consideration of a range of

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factors, such as chemical, physical, environmental, economic and social conditions (Sari and Sari 2020).

Land use reveals attributes, characteristics, mechanisms, evolution, regional differentiation and contradictions of human and land relations (Zhou et al. 2019). One important land use that transforms its natural state is land urbanization, which underlies the economic development of cities and rural settlements, improves education, health care and social infrastructure (Liu et al. 2017; Zienkiewicz et al. 2014).

The transformation of the existing land-use system within the framework of sustainable development of the United Nations is one of its main components. Rapid, large-scale exploitation of land for economic development, especially in recent decades in and around megacities, has had a negative impact on the environment (Sachs et al. 2019). Some authors note that the gap between the quality of life in different settlements, which is due to higher incomes of the population in cities, inefficiency and non-profitability in agriculture, also continues to increase the area of unused arable land, and leaving a significant number of "deaf villages" (Liu et al. 2017).

Sustainable urban management is associated with the recognition of land as an important end resource, as well as the need to determine the importance of land-use planning in the design of sustainable cities (Lourenco et al. 2020). According to Yin, Guanyi et al., reasonable zoning of territories in combination with dynamic land monitoring and control should be used for rational use and for the purpose of land protection (Yin et al. 2020).

According to O. A. Romanova, at present, the integrated development and development of new territories is based on the creation of various forms of municipal-private partnership and the creation of an appropriate legal framework in this regard. However, such a mechanism, according to the author, is not sufficient to ensure the sustainable uniform development of the territories of municipalities, the creation of a balanced development of the territories of settlements in the Russian Federation and favorable living conditions of the population living in these territories (Romanova 2018).

Active participants in land relations in settlements are various actors, the dominant role of which belongs to the municipal authorities. It is they who solve the issues of reservation and seizure of land necessary for the implementation of various municipal programs, are responsible for establishing the rules of land use and development of municipal territories, the development and implementation of land use programs, etc. It is the competence of municipal authorities that the law includes the performance of control functions, including in the field of land management.

In addition to the authorities, the local public is also involved in the control of the effective use of land and the realization of the rights and interests of all subjects of land relations, the functioning of state authorities and local self-government bodies, and activities related to the adoption of decisions, subsequently related to subjects of land relations. This type of control in the Housing Code of the Russian Federation (Art. 72.1) is called public, and its subjects are the population, public associations, non-state non-profit organizations (Land Code of the Russian Federation 2001).

It should be noted that for a long time land control was carried out only at the federal level. The authors point to the dual importance of such a phenomenon in legal regulation and land administration. Thus, municipalities have the right to form a legislative framework in order to fulfill the tasks related to the development of settlements and the creation of effective conditions for the life, activity and recreation of resident citizens (Kuzmich and Zang 2019; Samonchik 2018). Others note that only the legal framework developed at the level of the Russian Federation is the basis for consolidating the principles of land control in the territories of municipalities (Volkova 2018; Romanova 2016). All this caused many problems in municipal land practice, as well as in the subsequent judicial and administrative spheres. Based on this, we can conclude that the problem of studying theoretical and practical problems in the field of land control is relevant.

The purpose of the work is a comprehensive analysis of the institute of land control to identify problems and formulate proposals for their further solution.

2 Methodology

In the course of the study, methods such as comparative, analytical were used. The methodological basis of the research was the concept of sustainable development, work on land, municipal and environmental law.

3 Results

According to the provisions of Art. 72 of the Land Code of the Russian Federation (hereinafter referred to as the RK Code) "municipal land control—the activities of local self-government bodies to monitor compliance by state authorities, local self-government bodies, legal entities, individual entrepreneurs, citizens in relation to land relations objects with the requirements of the legislation of the Russian Federation, the legislation of a subject of the Russian Federation, for violation of which the legislation of the Russian Federation, the legislation of a subject of the Russian Federation provides for administrative and other liability" (Land Code of the Russian Federation of 2001).

In the Russian Federation, the system of bodies monitoring compliance with the requirements of land legislation consists of two interconnected types: state and municipal. At the same time, they differ in the powers to conduct control measures, the procedures for their implementation, and also lead to various consequences (About Protection of the Rights 2020).

A comparative analysis of the types of land control makes it possible to distinguish the main distinctive characteristic of municipal land control—the lack of authority of local authorities to initiate cases of administrative offenses in relation to violations of the requirements of land legislation. The municipal authority is not entitled to

consider such cases and bring the perpetrators to justice. However, it should be borne in mind that the act, which is drawn up by an official of the municipal land control body, subsequently gives rise to legal consequences for the owner of the land plot, not only in the form of an order contained in such an act, but also in the form of an unconditional basis for consideration of the relevant material by the state land control body for the existence of an offense, the commission of which is provided for by law (About the Approval 2014).

Despite the active work of the legislator in the field of regulation of land relations, there are enough gaps in the regulatory framework of municipal land control that hinder its effectiveness. We have identified the following:

- To date, the legislation does not define the subject area of municipal land control. For example, the subject of this type of control is all administrative and other violations related to the use and protection of a land plot. However, this can often be associated with a violation of another type of legislation (sanitary-epidemiological, environmental, etc.);
- Local self-government bodies exercising land control are now de facto unable to conduct unscheduled inspections. Many authors believe that this is the basis for the impossibility of exercising their powers by these bodies. And if we also take into account that the municipal control authorities are not entitled to initiate cases of administrative offenses, then we can think about whether such control is needed at all;
- At the regional level, there is still no systematic regulatory framework for land control, which is reflected in the subsequent adoption by municipalities of their own instruments on the legal regulation of rational land use and protection of municipal lands. According to R. M. Rafikov, D. N. Markin, at the beginning of 2018, only 8.5% of municipalities developed legal acts in the field of municipal control (Rafikov and Markin 2019).

As an effective option for optimizing control and supervisory activities in land relations, it can be the unification of verification measures of state supervision bodies (Rossreestr, Rosselkhoznadzor, Rosprirodnadzor and their territorial bodies) on the one hand and municipal control (local authorities) on the other.

Only in 2014, public land control appeared in Russia, the specificity of which is that it is necessary both to monitor the fulfilment of its duties by land rights holders, and to coordinate the activities of state and municipal authorities in the field of land management, as well as their use and protection (Romanova 2016).

Based on this, the polar nature of public land control is revealed:

- assistance to existing monitoring bodies,
- guarantee of realization of land rights of individual subjects.

According to the provisions of Art. 18 of the Federal Law "On the Basics of Public Control in the Russian Federation" (About Bases of Public Control 2014) public control is carried out in various forms: monitoring, verification, examination, discussions, hearings, etc.

We believe that the effective activities of the institution of public land control should be constantly accompanied by the development of norms and regulations, detailed regulation of the control procedure in special laws at the level of the whole country and regions. Thus, in many constituent entities of the Russian Federation, regional acts on public control have been put into force. For example, in Art. 2 of the Law of the Nizhny Novgorod Region (About Public Control in the Nizhny 2015) there are reference provisions to some laws of the region, which should regulate the features of public control in certain areas of public relations. The Law of the Chuvash Republic (About Public Control in the Chuvash Republic 2015) defines that public monitoring commissions, public inspections, public control groups, etc. may participate in public control.

Let us turn to the experience of foreign countries. For example, Norway has established rules for public participation in municipal land-use planning (Holsen 2020). The current planning policy for sustainable development of the Territories places great emphasis on the importance of public participation. In Scotland, this policy aims to empower participants and social control, which means public participation to achieve results (Aitken 2020).

Another striking example of regional sustainability is the introduction of ecosystem services assessment in planning in the three municipalities of the capital city of Turin (Italy) during the LIFE SAM4CP project, which helped local administrations to identify land-use planning priorities, such as defining land-use control strategies and defining urban growth boundaries (Salata et al. 2020).

4 Conclusion

Therefore, the development of land control requires further study. In order to modernize municipal and public land control, it is advisable to:

- In order to continue the work on information support of control, which is understood as the legislative activity of representative authorities of regions and municipalities, and informing participants in land relations about current changes in the field of land control, their rights and duties, consequences of failure to comply with the requirements of officials carrying out this type of control, through the Internet, mass media, digital technologies (for example, through special applications), etc.;
- Review the training of relevant personnel in the municipal land control system, including by organizing special courses in vocational education organizations, organizing additional advanced training courses, holding seminars, exchanging experience with land control authorities of other municipalities and regions;
- At the legislative level:
- include norms establishing the powers of individuals in participating in activities related to the adoption of important issues in the field of land relations, the powers and responsibilities of state authorities and local self-government bodies for the realization of land rights of participants in land legal relations;

- specify in detail the forms and methods of participation of the population in land control, including when violations are committed by officials, which can lead to negative consequences, including long-term prospects.

Therefore, it is crucial to recognize that all innovations in the land-use system require much deeper reflection and consideration of specific local conditions. Although certain types of land control show their significance, only the close cooperation of state land control and municipal control officials with local stakeholders (including representatives of public control) is key to the implementation of effective land use. The main role in land management should be played by the state (for example, in the person of the Government), which should continue to reform land systems. All land-use issues should be adapted to local conditions and traditions, so all control issues should be coordinated by society, local people, their level of development, which will lead to more effective land use and sustainable development of land municipalities.

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Transformation of the Organizational Structure of the Commercial Service of the Regional Retail Trade of Consumer Cooperation in the Management System Based on the Implementation of Network Management Functions

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Abstract The main purpose of this article is to present the vision of the authors who participated in the scientific research commissioned by BRUCS (Belarusian Republican Union of Consumer Societies) on the problem of increasing the efficiency of management of the trade sector of consumer cooperation at the regional level. As a result of the theory and practice of business process management in retail network organizations, and more than 10 years of research experience in the implementation of network principles and methods of work, the authors proposed the implementation of the developed practice and principles of transferring the organization of the consumer cooperation trade system in Belarus to network principles of commercial service management. The research methodology is based on knowledge of the essence, principles and methods of networkization of control systems and system management. Comparison and analysis methods are also widely used. Currently, the proposals of the authors are being implemented by cooperation of cooperation, starting with the level of branches of the regional consumer society. According to the authors' calculations, the estimated economic effect from the implementation of developments and proposals presented in the study will amount to 331363 USD.

Keywords Management · Organizational structure · Network trade · Category management · M00

JET Code M00

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1 Introduction

The existing organizational and management structure in the trade sector of consumer cooperation has pronounced characteristics of a vertical system that does not correspond to the drastically changed and continues to change conditions of the market macro- and microenvironment of the environment of activity. The general management of commercial activities in the field of trade of the regional consumer society (BRUCS) is carried out by the trade department of the central office (Fig. 1).

The department of trade is an independent structural unit, subordinate to the board of the regional administration and directly to the deputy chairman of the board for trade and public catering. At the same time, the trade department and the regional administration board are subordinate to the trade department of BRUCS and the Board of BRUCS. Along with this, the BRUCS interacts with the wholesale base of the Unitary Enterprise "Belkopvneshtorg" BRUCS, which has an independent significance in the BRUCS system.

Thus, there is a ramified vertical system of business process management, which introduces the problem of multi-level and inconsistent subordination to several centers of responsibility, which, in the authors' opinion, is one of the reasons for

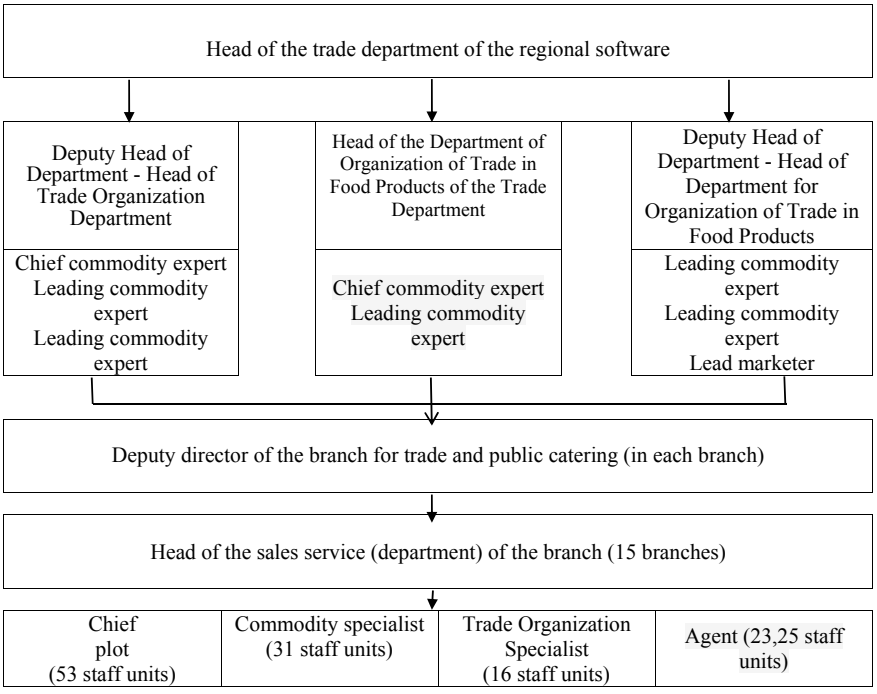

Fig. 1 Organizational structure of the regional PO commercial service as of 01.03.2018. *Source* Compiled by the authors

the imbalance of the system and ineffective management. The inefficiency of the management system is evidenced by the main indicator of the competitiveness of the industry—the market share, which is steadily declining. According to official statistics, (Retail and Wholesale Trade, Public Catering in the Republic of Belarus 2019), the share of consumer cooperation in the retail turnover of trade organizations of the republic decreased from 10.8% 2012 to 5.1% in 2018.

2 Materials and Methods

Using methods of observation, comparison and analysis of systems. Let us consider the system of interactions in the control system at the level of the regional trade control. The direct management of the trade department is carried out by the chief who is responsible for the work of the department and subordinate organizations of the system. There are three departments in the department of trade of the region: the department for organizing food products, the department for organizing trade in non-food products and the department for organizing trade. The Department of Trade carries out methodological management of the work of the branches of regional organizations, unitary enterprises.

At the regional level, in the branches of the regional business, commercial work is headed by the deputy directors of the branches for trade and public catering. In all branches, with the exception of two, the sales service (department) is headed by the chiefs of the service (department). The head of the sales department directly supervises the activities of the department and controls the work of all employees of the sales department. In one of the branches, the position of deputy head of the trade department is provided.

The tasks and functions of the regional trade department and trade departments of the branches are established by the Regulations on the trade department and the Regulations on the trade department (service) for all branches. It should be noted that the regional industrial association does not use a unified regulation on the sales department for all branches. Branch regulations have some differences in content and scope.

The study of the commercial service in the context of the central office of the regional and branch offices showed that the main tasks of the central office are: organization of public services; meeting the demand of the rural population; organization of business relations with suppliers; rendering various kinds of methodological and practical assistance to branches on the organization of trade; improving the work of commercial services of branches, etc. The regulation on the trade department of the branch formulates one task: to ensure uninterrupted supply of goods in accordance with the established range and demand of the population. The regional trade department is engaged in organizing economic relations with suppliers, establishing direct contractual ties with industry; management of commodity resources, organization of supply of trade organizations with food and non-food products; organization of fairs.

The list of functions of the commercial service at the oblast level is much wider than the level of branches. The regional trade department carries out organizational management of the region's trade, the trade apparatus of the branches, ensures the establishment and strengthening of economic ties with suppliers, the study of demand, the formation of the needs of trade organizations for food and non-food products for the coming year, the effective use of commodity resources, the introduction of a centralized delivery of goods to the retail trade network. A significant part of the functions is aimed at monitoring the work of subordinate organizations on the main elements of commercial activity related to the purchase and development of procurement volumes, the organization of retail trade, the state of inventories, etc. Functions are envisaged aimed at providing practical assistance to subordinate organizations in matters of trade organization.

The functions of the sales department of the branch include: study of demand; preparation and conclusion of contracts; control over the fulfillment of contractual obligations; control of sales by product groups and individual names of goods; taking measures to prevent excess stocks; control over the observance of the rules of trade, etc. The trade department of the branches is obliged to perform such functions as, study and application of the experience of network trade based on the principles of category management for the stores of the branch; introduction of modern mechanisms of trading activities (use of uniform product matrices, marketing and advertising activities).

Thus, the division of the functions of commercial activity between the commercial service of the central office of the regional and branches is traced. At the regional industrial association level, work is concentrated on organizing the procurement of goods, establishing economic ties with the majority of suppliers, providing various methodological and practical assistance to branches in organizing trade, improving the work of commercial services of branches, organizing control, etc. At the level of branches, work is concentrated on organizing retail trade, product assortment management. Such important strategic directions in the field of assortment (studying and applying the experience of chain trading with the introduction of the principles of category management) are the functions of the commercial service of the branch, and not the central office. At the same time, as shown by the analysis carried out in "Pioneer-BRUCS" (the first regional consumer union, which switched to the management system of the regional consumer society), at the present time the principles of network trade management have not been introduced here, except for the centralization of financial resources. There is no responsibility of one specialist for the entire cycle of movement of goods from purchase to sale, in which each product category is considered as a mini-enterprise within a trade organization with its own budget, pricing, procurement policy, etc. As noted in their study, Naumenko and Pigunova (2019), it is one of the key conditions for assortment management in networked retail organizations. This approach is used by all leading retailers that are the main competitors of consumer cooperation.

In accordance with the theory and practice of retail development, network and non-network forms of its organization are distinguished. In case of transition of a retail trade organization to network management principles, it is necessary to transform

the organizational structure of trade management, including its commercial service. At the same time, it is advisable to use more than five years of positive experience and take into account the problems of "Pioneer-BRUCS".

The clear advantages of creating a regional consumer society are as follows:

- mobilization of financial resources and building up the potential for strategic development (construction of profitable facilities, training of managers and specialists, purchase and implementation of modern information technologies and software products, entry into the e-commerce market);
- ensuring centralized purchases, and, consequently, deriving benefits from economies of scale, the formation of prices that are favorable for the consumer in stationary and non-stationary trade objects of trade;
- improving the efficiency of managing the trade sector at the regional level, subject to the introduction of a modern logistics management tool—category management.

In the process of studying the theoretical approaches and practice of business process management in the object of research, the authors identified the following main problems associated with the implementation of category management:

- lack of managers and specialists with knowledge, skills, and even more so—experience in the Central Office;
- management of commodity flows according to ineffective schemes of commodity circulation and schemes of centralized management of financial resources inconsistent with them, which leads to a conflict between the control center and centers of responsibility;
- the problem of lack of marketable goods at the first stage of centralization of the organization's financial resources management;
- the lack of system automation of retail facilities leads to non-fulfillment of orders for the delivery of goods to retail facilities, which does not allow managing flows from the central office;
- resistance from below and from above to ongoing changes. Resistance "from below" appears due to the fact that branches are losing leverage in choosing sources of purchases, determining delivery terms, and on financial flows. Coordination with the central office is required for purchases from local suppliers if the goods are not available from the intra-system supplier. "Empty shelves" appear, retail objects lose customers, which causes complaints from customers and creates a favorable situation for the arrival of chains. As a result, the anti-image of the system is formed. Large trading networks take advantage of it. Above, it is required to quickly acquire the minimum required competencies in a new, innovative area - category management. The discrepancies in qualifications, the need for the availability of necessary innovative knowledge for the system, skills and abilities are revealed. Inertia is strong, which is difficult to "break";
- the reorganization of the commercial service of the oblast to implement the goals of category management will inevitably lead to optimization of the number of employees, most likely to their reduction.

3 Results

The results of the scientific study showed that the system requires the introduction of fundamentally new approaches to managing the trade industry, including its commercial service, which implies:

1. Creation of the central office of the regional trade organization.
2. Implementation of the basic principles of business process management in network trade:
    - changing the scheme and structure of automated industry management;
    - cardinal changes in the commercial service based on the principles of category management [see p. 146 (Naumenko and Pigunova 2019)].

The authors developed and proposed a variant of the organizational structure of the commercial service for a retail trade association at the regional level, based on the principles and approaches of category management [see p. 146, Fig. 1 (Naumenko and Pigunova 2019)].

This structure assumes that category managers will be subordinate to the heads of the purchasing and selling departments. And this approach is reasonable. The specialists who manage the procurement and sales departments have competencies in strategic management, the prospects for the development of the company's assortment as a whole, the development of assortment matrices in the context of store formats.

Category managers develop assortment matrices for reporting categories of goods, make management decisions on setting parameters for assessing performance, conducting pricing policy and other issues related to promoting each product category, drawing up planograms.

At the regional level, in addition, structural divisions of logistics and marketing are being created to ensure the solution of issues related to the organization of goods movement, their storage, the development of a marketing strategy for the development of product categories, a trading network. The district-level commercial service (branches) ensures the sale of goods in accordance with the developed assortment matrices, carries out operational control over their relevance, uses tools for the effective presentation of product categories in the sales area.

An important issue in the construction of the commercial service of the regional retail organization is the determination of the structure of the purchase and sale departments. When solving this issue, you can use the experience of building a commercial service based on the category management of companies with network management principles. As practice shows, large chain retail companies operating through multi-format stores with an assortment of more than 10,000 SKUs use a hierarchical structure of assortment management with the allocation of departments by direction and product group. In each of the departments, there are divisions in which category managers work. The number of these specialists depends on the number of product categories included in this area, the depth of product categories.

For example, the department "Fast food" may include divisions: "Fish, fish products, cooking", "Vegetables and fruits" and others.

In the system of consumer cooperation, a similar approach is implemented when building the organizational structure of the commercial service "Belcoopvneshtorg BRUCS". There are two departments at this enterprise: department for the purchase and sale of non-food products; department for the purchase and sale of food products. In turn, in the departments for purchase and sale, structural divisions are allocated by product lines and groups of products. As shown by the study, the organizational structure of the commercial service "Belkoopvneshtorg" as a whole corresponds to the criteria typical of trading companies with network management functions. With the transition to the network principles of the trade industry of consumer cooperation, the commercial service of the central office of the regional retail organization can be built using a similar approach.

In this case, the use of the matrix structure of the commercial service is assumed, in which the management of product categories is carried out by category managers in direct interaction with the branches of the regional retail organization, other services of the central office (Fig. 2).

The point of intersection of the areas of responsibility and interests of the category manager and the head of the service and the deputy director of the trade branch.

The authors developed proposals for the distribution of functions between the departments of the commercial service, the order of their interaction with each other (Regulations on departments). As noted by Sysoeva (2015), Novikov (2015), one of the problems of the proposed version of the organizational structure is the double subordination of employees: the category manager and the director of the branch. The solution to this problem can be the development of regulations for assortment management business processes, work standards for employees, including those under double subordination.

From the theory and practice of effective management, it is known that a leader with a team of proactive and qualified specialists in the company's management apparatus is able to radically change the situation, using such active and convincing forms of interaction with the team as simple information, explanations, collective discussions, education, trainings. It is important to maintain an atmosphere of honesty, transparency, openness, teamwork. Social and material motivation, an adequate level of remuneration and an effective system of incentives for using innovative tools for managing business processes and other elements of the scientific organization of labor (optimal work schedules, including remote work at home) significantly reduce the tension in the team, thereby and—resistance to innovation. It is strongly discouraged to use the "if you can't—make space" approach. This aspect is very important to consider, since experienced specialists are potentially a condition for the organization to quickly adapt to the changes being made. It is also recommended by the management practice at the initial stage of the introduction of new approaches and management tools to involve managers and specialists from well-known retail chains to adapt a new approach to managing financial, material, information and customer flows. A prerequisite in this transformation process is a permanently functioning link between retail facilities, the central office and the company's logistics structures on

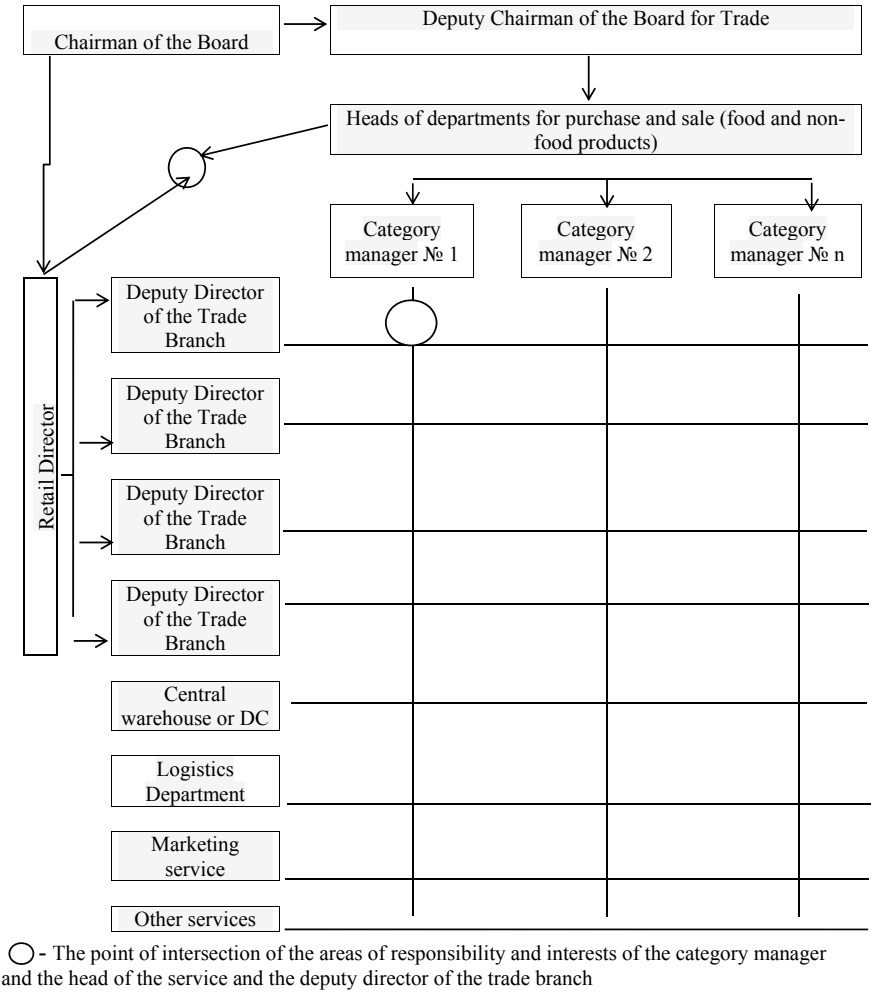

Fig. 2 A variant of the matrix organizational structure of the commercial service of the regional retail organization with network management functions. *Source* Naumenko and Pigunova (2019), p. 148

the basis of comprehensive and systematic automation of business processes in the distribution chain.

In the case of the implementation of proposals for reforming the organizational structure of the commercial service of the regional retail organization and the transition to the technology of category management, the authors estimated the possible economic effect. At the time of the study, the commercial service of the regional branch consisted of 177 staff units (the department of trade of the regional branch—12 and branches—165). Calculations have shown that after the reorganization, the

number of employees of the commercial service will be 102 staff units: Department for the purchase and sale of goods—43 staff units (by analogy with industrial association "Belkoopvneshtorg" BRUCS); in branches—48 full-time; the logistics department has 7 staff members, the marketing department has 5 staff members. The average accrued wages during the research period "Pioneer-BRUCS" was 600 BYN (including deductions for social insurance—810 BYN). Thus, only the savings in wages for the year will be [(177–102) * 810 * 12] = 729,000 BYN (at the rate of the National Bank of the Republic of Belarus—$331363).

4 Conclusion

Summarizing all of the above, it can be assumed that the commercial service of the regional consumer society, which uses network management principles, can be headed by the deputy chairman of the board for trade. A commercial service may have in its structure dedicated departments for the purchase and sale of food and for the purchase and sale of non-food products. They, in turn, may have product lines under the direction of category managers. It is recommended to use the structure of the commercial service "Belkoopvneshtorg BRUCS" as a baseline. The central office also has departments for retail sales, marketing, logistics and foreign economic communications (if the latter is not implemented at a decent level by "Belkoopvneshtorg"). We offer branch-level retail management to be headed by branch directors. The centralization of all processes for the purchase and sale will inevitably lead to an optimization of the number of employees of the commercial service at this level. From our point of view, up to 3 commerce specialists are enough, with a simultaneous increase in the number of employees of the commercial apparatus in the central office at the regional management level.

The issue of creating a logistics department requires a detailed study and justification, both in terms of number and structure. But the very fact of the necessity of its creation is of strategic importance. It is also important to solve the problem of optimizing the number and composition of employees at the management level of regions and districts. This work should be accompanied by training in the principles, methods and tools of category management from among the most promising employees of the company. Along with this, it is necessary to carry out work on the introduction of universal automation of workplaces for new managers and specialists along the entire chain of commodity distribution. At present, such work is carried out on the basis of the use of the LS FUSION software product, developed by Belarusian programmers.

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Assessment of the Risk of Loss of Social and Economic Development of the Municipality with the Help of Exponential Function

Anna V. Mendel, Lyudmila V. Grokholsky, Alexey Y. Mitrofanov, Raisa V. Kalinicheva, and Natalia N. Elistratova

Abstract The article proposes a methodology for assessing the risk of loss of stability of the socio-economic development of a municipality based on an assessment of the probability of changing targets in the desired direction (on a given forecasting horizon). The latter is estimated using a four-parameter nonlinear trend model (called the exponential trend), summarizing linear, exponential and logistic trends. This model has high enough flexibility to describe the dynamics of various socio-economic indicators during the period of change in direction and type of trends, which is characteristic of modern Russia. In order to increase the reliability of estimating the parameters of the trend model using the nonlinear least squares method, the vectors of the starting parameters are set by chance. The probabilities of an indicator growth, both for individual moments of time and on average for the forecast interval, are determined by random vectors of parameters generated from a four-dimensional normal distribution found as a result of estimation. An example of the implementation of the methodology for assessing the sustainability of the development of the city of Saratov is given. The github site provides free access to the source code (for package R) and examples of implementation of the technique.

Keywords Sustainable development · Municipality · Risk · Exponential trend · Forecast · Probability of growth

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1 Introduction

Since its inception, the concept of sustainable development has been widely accepted throughout the world.

The intuitive point of sustainable development is to switch to technologies that use non-renewable resources to the least, as well as reducing externals to a volume that can recycle the environment without irreversibly reducing the ability to recycle. Also, the concept of sustainable development involves a corresponding change in the way people think about economic decisions.

At the same time, it is common knowledge that formally accepted sustainable development ideas are often accompanied by opposing practices.

The principles and ideas of sustainable development, most closely related to the extraction of natural resources and waste management, can be extended to other socio-economic systems, in particular to municipalities. The socio-economic development of both large cities and territories with predominantly rural settlements can, in principle, be analysed from the point of view of sustainability, that is, the extent to which they use renewable resources and limit the burden on the environment to an acceptable minimum.

The purpose of the work is to propose a simple, easily implemented methodology that applies to municipal formations (hereinafter referred to as MF), for which in the recent past the problems of sustainability of socio-economic development (hereinafter referred to as SED) have not been posed, but for which the issues of sustainability of SED are becoming more and more relevant.

Unlike many studies, the authors of which seek to characterize quantify certain aspects of the sustainability of the development of the society and/or the economy of the region as a whole or its industries, this work focuses on the assessment of the risk of loss of sustainability of development, that is, it is assumed that the studied MF in the recent past developed sustainably.

Without trying to quantify the scale of this problem (this can be done, including using the proposed methodology), we expert assess that the problems of SED sustainability affect at least half of all Russian MF. Of course, a clarification of the essence of MF is required here, see further on.

When developing the methodology, we put forward the following five requirements:

1. it must use data on MF published by Rosstat (constituting the latter's passports);
2. its results without special explanations should be understood by representatives of authorities, local self-government, civil servants;
3. it must be implemented on almost any personal computer;
4. when implementing it, only freely distributed software should be used;
5. it should allow efficient automation of calculations (a typical region of Russia includes several dozen MF, each of which is characterized by several dozen indicators);
6. its implementation should not require the involvement of highly qualified specialists.

Theoretical and applied questions on the problem studied in this article are disclosed in the work of Ginis et al. (2016). The authors also used the materials from A Language and Environment for Statistical Computing (R Core Team 2019) in this study.

2 Materials and Method

The latter requirement excludes the construction of complex socio-economic models, including production functions, certain forms of intersectoral relations. In fact, acceptable methodologies should be statistical (economic).

Consider briefly the reasoning that led the authors to the proposed approach. The development of any socio-economic object, and in particular the MF, is characterized by a system of indicators. Accordingly, the risk of loss of stability of MF development should be assessed in terms of the latter. In addition, it is obvious that the very concept of risk, as a characteristic of the probability of future adverse circumstances, is definitely predictive.

On the other hand, the idea arises to characterize the stability of SED MF, based on the mathematical definition of the stability of a dynamic system. Informally, the latter is the ability of the system, granted to itself, and deviated from the position of equilibrium, to return to the latter. Descriptions of dynamics of this kind have long found their place in econometrics in scalar and vector models of error correction. However, the practical construction of such models, as well as other models of time series, requires at least several dozen observations—a number that is still long unattainable for MF. As already noted, the implementation of methods based on the relationship between SED indicators is excluded due to the difficulty of constructing such models requiring the involvement of highly skilled economists.

Therefore, the SED resistance risk assessment method for MF should (1) be practicable for short time series; (2) have a forecast character; (3) in contrast to the methodology proposed in Database of Indicators 2019), should consider the dynamics of each indicator included in the system in isolation.

The question remains: how can we describe the dynamics of an individual indicator in terms of the possibility of its adverse change in the future? In fact, there remains an approach based on trend models. The essence of any such model is to decompose (as a rule, additive) the values of the indicator into two components: natural and random. Two varieties of models of this kind are known: parametric and non-parametric. The peculiarity of the former is that the natural part depends, in addition to time, on a small number of parameters. Non-parametric trend models, of which the most common are local linear trend models (LOESS), regression and smoothing splines, include a much larger number of parameters. Thanks to the latter, non-parametric models are able to reproduce almost any dynamics with good accuracy, but the "cost" of this is the need for a large number of observations to reliably determine numerous parameters. The latter for short series, the only available for MF, is impossible—the desirable property of the trend pattern is violated.

Thus, the only possible way is to describe the dynamics using a suitable parametric trend. Often used trend models: linear, exponential—linear for logarithm, quadratic should be immediately discarded, since the first two most often do not adequately describe the dynamics of indicators at the current stage of Russian development, and quadratic trend (and, moreover, polynomial trends of higher degrees) give too unstable forecasts. Therefore, a trend is needed, set by a small number of parameters (preferably no more than four), and having, on the one hand, sufficient flexibility to describe various types of dynamics with a change in trend, and, on the other hand, sufficient "rigidity" to obtain sufficiently reliable forecasts.

Let us suppose that this trend is found. Predicting it into the future, we are faced with natural uncertainty due to inaccurate knowledge of the parameters (estimated using the least squares method, see below). In principle, in addition to the only conditionally "best" set of parameters, other sets quite close to it are possible, which will correspond to their forecast values. It makes no sense to ignore these possibilities, as a result of which it seems rational to consider the forecast of the dynamics of the indicator in the form of many trend options corresponding to these close sets of parameters. For each such trend, you can consider the forecast of dynamics from the point of view of (not) favorability, while the desired direction of dynamics is often easily determined by experts.

Of course, the direction of prognosis may vary depending on both the time and the specific implementation (given by the parameter set variant). Therefore, in order to characterize the future direction of dynamics in terms of its (not) favorability for the grid of future time points (with a step set by the user, by default, quarterly), derived trend variants determined by random sets of parameters are calculated (details of the algorithm are described later).

Thus, we come to the following characteristic of the risk of loss of stability of SED MF: for each indicator of the selected indicator system, the probability of its growth in the future is estimated both for individual time values (in a given interval) and in general for the forecast interval. The risk of loss of stability of SED MF for this indicator is defined by us as the probability of its growth if growth is desirable for this indicator, and the probability of decrease otherwise. Calculation practice has shown that the probability of growth practically does not depend on the specific time point of the forecast interval, so it is quite possible to use the average probability of growth over the entire interval. Therefore, for each indicator you can get the probability of the desired change in the future (on a given horizon). For the scorecard, as the most "problematic," we consider those indicators for which the probability of the desired change is the least (for an example, see below).

As a trend model, we use the following model, the "exponential" trend:

$$Y_t = \beta_0 + \frac{\beta_1 \times (t - \beta_3)}{1 + \exp(-\beta_2 \times (t - \beta_3))} + \varepsilon_t$$

where ε_t—white noise, $M(\varepsilon_t) = 0$, $Var(\varepsilon_t) = \sigma^2$.

Let's take a brief look at the exponential trend properties:

$$T_{EL}(t) = \beta_0 + \frac{\beta_1 \times (t - \beta_3)}{1 + \exp(-\beta_2 \times (t - \beta_3))}.$$

At $\beta_2 = 0$ it turns into a linear trend:

$$T_{EL}(t|\beta_2 = 0) = (\beta_0 - \beta_1 \times \beta_3/2) + \beta_1 \times t/2.$$

In the case of $\beta_2 > 0$ the limit at is $T_{EL}(t)$ when $t \to -\infty$ will be equall to β_0, while at $t \to +\infty$ it will have an asymptote of $(\beta_0 - \beta_1 \times \beta_3) + \beta_1 \times t$, at $\beta_2 < 0$ respectively, the same left-hand asymptote and limit. The trend has no more than one critical point defined by a nonlinear equation: $t = -(1 - \beta_2 \times \beta_3 + \exp(\beta_2(t - \beta_3)))/\beta_2$. See Fig. 1 for an example of adjusting the

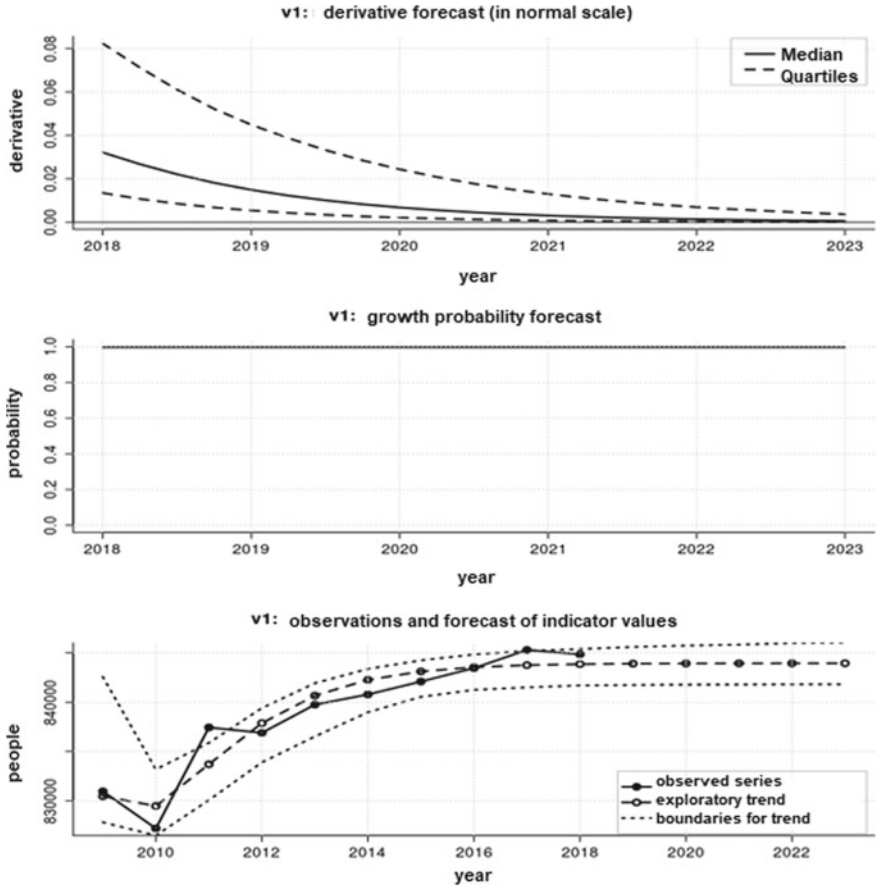

Fig. 1 Analysis of stability of population dynamics in Saratov: derivative forecast (median quartile), probability of growth, observed and forecast values. *Source* Complied by the authors

exponential trend, as well as the RiskSust.docx file on the accompanying github website (see below).

Algorithm Description

The initial data for the main algorithm implemented in the function of the package R est_expolin.R is the data table R (data.frame), containing the observation year, the name of the analyzed indicator and the prediction horizon (in years, by default 5 years), while some values of the indicator may be absent (NA).

The main stages of the algorithm:

- Isolate data for the key figure (y) to be analyzed, check the data and delete missing values.
- If there is no variation in the indicator values, the output with the completion code is -3.
- Normalization of time values (t) and y using linear function in interval [0; 1].
- Generation of a given number (default 1000) of random vectors of starting parameters from a uniform distribution of U $(-5, 5)$.
- For each start parameter vector, estimating model parameters for normalized data using the nonlinear least squares method (Nelder-Mead optimization method).
- Isolating those evaluation options for which convergence is achieved, searching among them for a vector of estimates with the smallest value of the sum of squares of residues.
- Calculation of the matrix of exponential function gradients at observational points and the previously found parameter vector (analogue of the X plan matrix for the linear regression model).
- Evaluation of variance of random disturbance σ^2.
- Definition of covariance matrix and standard errors of coefficient estimates (similar to the formula for linear regression).
- Generation of 4-dimensional random parameter vectors (default 1000) from a multivariate normal distribution with the parameters [mu], [mu] - found earlier by the parameter vector and the covariance matrix.
- Determine for each set of random parameters of the vector the values of the derivative of the exponential trend by time for all points of the forecast interval (by default with a quarterly step).
- If there are missing derivative values, an attempt is made to smooth the original series using the Hodrick-Prescott filter and run the algorithm again. If the source series contains missing values in the middle, smoothing fails, and the algorithm ends with code -5. If smoothing succeeds, but some values of the derivative are also absent, the algorithm ends with code -4.
- Determination for each point of the forecast interval of the median and quartiles of the derivative, creation of the corresponding graph.
- Determination for each point of the forecast interval of the probability of exponential trend growth as a fraction of non-negative derivative values, plotting the dynamics of the probability of indicator growth.

- Recalculation of estimates of the parameters of the exponential trend and their standard errors from the normalized scale to the real one, presentation of estimates in the usual form with accuracy characteristics (standard model error, determination coefficient, etc.).
- Plot the dynamics in the initial scale with confidence limits (by default with a reliability of 90%) for the exponential trend values for time values for which there are observations and forecasts.
- Determination of the range of deviations (in percent) of the lower and upper trend limits from the trend. Warning about possible unreliability of the model if deviations exceed the specified level (±50% by default). If both boundaries are not exceeded, the algorithm ends with code 0, otherwise with code −1.

The result of the algorithm is a triple: the completion code, the average probability of the expansion of the exponential trend over the entire forecast interval, the name of the variable—the indicator being analyzed (in the case of using the Hodrick-Prescott filter, the suffix "_hp"), the range of forecast time values is added to it.

As an example of the application of the proposed methodology, we consider determining the risk of loss of stability of the development of Saratov in the light of the dynamics of its population.

The initial data were taken from the passport of the municipality of Saratov (Avdeeva et al. 2007): the indicator "Estimate of the population as of January 1 of this year, people," data from 2010 to 2019 inclusive. The algorithm is implemented using the packet R (Genz 2009), also packets are used - extensions mvtnorm (Balcilar 2019) (generation of vectors from a multivariate normal distribution) and mFilter (Mitrofanov 2019) (smoothing of a series with a Hodrick-Prescott filter). The algorithm implementation code is in the public domain (Kuznetsova 2017). The results of issuing the program follow:

```
## ========================================
## v1
## Estimated population as of January 1 of the current year.
## +--------------------------------------+
## | Version 0.6, developer A.Yu. Mitrofanov |
## +--------------------------------------+
## The series to analyze: v1
##
## 1000 random start vectors were used.
## 1000 random parameter vectors were used.
##
## Factor:
## b0 : 843952.2
## b1 : -46992.65
## b2 : -0.8613517
## b3 : 2008.077
##
## ±-Point Error Factor:
## b0 : 844000 ± 1300
## b1 : -47000 ± 16000
## b2 : -0,86 ± 0,24
## b3 : 2008,08 ± 0,57
##
## Rating st. Error t Pr (> | t |)
## b0  8.4395e+05 1.3011e+03  648.6500 8.8818e-16
## b1 -4.6993e+04 1.5642e+04   -3.0043 2.3875e-02
## b2 -8.6135e-01 2.4027e-01   -3.5850 1.1574e-02
## b3  2.0081e+03 5.6642e-01 3545.2000 0.0000e+00
## dfR=     6
## sigma^=  2152.4
## R^2=     0.9126
## R^2adj.= 0.8689
##
## * * * All values are approximate because the model
## does not take into account the autocorrelation of random disturbances. * * *
##
## Trend upper bound deviation range is 0.132 1.46%.
## Trend lower bound deviation range: -0.493 -0.252%
##
## ------------------------------------
## v1: Average Forecast Probability:
## - growth: 0.998
## - decrease: 0.002
## ------------------------------------
```

3 Results

As it can be seen from Fig. 1, in 2018–2023, the population of Saratov is projected to grow—positive values of the derivative are predicted, approaching zero. The estimate of the probability of growth, i.e. the change in the desired direction for the entire prediction interval is practically 1. Text output gives an average estimate of the probability of growth of 0.998, respectively, a decrease of 0.002, according to the forecast interval. The output code is 0—the expletive trend model seems adequate. The obtained results show that the dynamics of the population of Saratov does not indicate a loss of stability of its socio-economic development. Despite this conclusion, the close attention of the manager at the regional and municipal level should be paid to the predicted stabilization of the population of the city.

Table 1 Summary results of assessment of risk of loss of stability of social and economic development of Saratov by 6 indicators

Variable	Indicator	Unit of measure	Entry code	Vertical growth	Sci. program	Cont. program
v1	Population estimate as of January 1 of the current year	Person	0	0.998	2019	2023
v2	Total fertility rate	Per thousand	−1	0.23	2019	2023
v3	Total mortality rate	Per thousand	−1	0.6178	2019	2023
v4	Average number of employees of organizations (from 2017 to okved2)	Person	0	0.9995	2019	2023
v5	Profit (loss) before tax of the reporting year	Thousand rubles	−1	0.5756	2017	2021
v6_hp	Residential buildings put into operation on the territory of the municipality	sq. m of total area	−1	0	2018	2022

Source Complied by the authors

Similar calculations for five other indicators are contained in the RiskSust.docx file located on the aforementioned github website. The results are shown in Table 1.

4 Discussion

As it can be seen from Table 1, unfavorable changes in fertility and mortality rates are predicted (decrease of the first and growth of the second), favorable change in the number of employees of organizations—the probability of growth of 0.9995, rather uncertain growth in the profits of organizations (growth probability of 0.5676) and unfavorable dynamics of residential space input—almost certainly a decrease of the latter. We need to note that the algorithm did not predict the probability of residential area growth, and the algorithm automatically switched to the indicator obtained by smoothing using the Hodrick-Prescott filter (this is indicated by the suffix "_hp" in the variable name).

If we characterize the socio-economic development of Saratov with the help of this (extremely limited) set of indicators, we can conclude that the most problematic is the introduction of housing, in addition, the dynamics of fertility and mortality rates look quite unfavorable.

5 Conclusion

In conclusion, we note that the limited calculation experience according to the above methodology for 42 indicators for the city of Saratov showed the operability of the algorithm and its implementation in package R. For two indicators (4.8%), there was no variation. For 12 indicators (28.6%), the algorithm completed successfully (completion code 0). For 27 indicators (64.3%), the algorithm ended relatively successfully (completion code −1). For 5 initial indicators (11.9%), the algorithm did not give a certain result and was automatically restarted for a series smoothed by the Hodrick-Prescott filter; of these, in 4 cases, the algorithm completed successfully or relatively successfully. In general, out of 40 indicators that have a variation, for 39 (97.5%), the algorithm gave a certain estimate of the probability of growth.

For assessment of adequacy of estimates of probabilities of growth of the studied indicators the necessary data are absent now, but, in process of their accumulation, for this purpose it is possible to use, for example, square tags (quadratic scores).

Meaningful conclusions on the obtained probability of loss of stability correspond to expectations and, in general, serve the main goal—to draw the attention of decision makers affecting the socio-economic development of municipalities to the problematic aspects of the latter.

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Creation of Agro-technology Parks as a Direction of Innovative Development of the Regional Economy

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Abstract The purpose of this research is to study the effectiveness of the creation and development of agricultural technology parks as a mechanism of scientific and industrial cooperation in the agriculture of the region. In order to achieve the stated goal, based on the analysis of the legislative and regulatory framework, strategic planning documents for regional socio-economic development and scientific publications on the topic of research, the essential features of the concept of "agro-technology park" were clarified, the goals and objectives of creating and developing agro-technology parks were formulated, the main principles of organizing their activities were given, the types of effects from the development of the agro-technology park network were determined. The situation in the field of development of agricultural technology parks in the Krasnodar Territory is described. The legal foundations and forms of state support for agricultural technology parks in the region are considered. Conclusions were drawn on the need to strengthen the role of regional and local authorities in the process of forming agro-technological parks, and improve the mechanism of their state support. The role of agro-technology parks in the implementation of cluster policy in the regional economy is justified. In general, their creation is one of the key factors in the transition to an innovative model of the agrarian economy. The activities of agro-technology parks are based on the systematic integration of all elements of the development, implementation and commercialization of scientific achievements in the agro-sector, thus contributing to the formation of a mechanism for sectoral scientific and industrial cooperation. As a result of the development of the agro-technology park network, the necessary conditions will be created for highly

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competitive, export-oriented relations in the agricultural economy, for the transition of the industry from an extensive to an intensive type of development, including providing for an expanded reproduction of fixed assets.

Keywords Regional economy · Agro-technology park · Innovative development · Agricultural sector · Competitiveness

JEL Code Q13 · R1

1 Introduction

Currently, the most important task of the agricultural sector of the Russian economy is to increase the competitiveness of agricultural products based on technological modernization. Krasnodar Territory has the necessary potential to solve this problem: the area of black soils is more than 4% of Russian and about 2% of the world's reserves, favorable natural conditions, dynamic agricultural development, the presence of a developed processing complex, and a high level of attracting investment in the economy.

The region is one of the leaders in the Russian Federation in the production and processing of agricultural products and food supplies to Russian industrial centers, ranks 1st in the country in the production of crop production and 3rd in the production of livestock products. In general, the share of regional agricultural products in the volume of gross agricultural products of the country is more than 7%. The active development of agribusiness in the region corresponds to federal priorities and ensures food security (Law of the Krasnodar region of December 2018; Plotnikova et al. 2017).

However, the achievement of the task of increasing the competitiveness of agricultural products is hindered by the slow pace of scientific and technological development of the industry. The technological backlog of production from developed countries limits the growth of production in the long term and is among the most significant risks in the area of state food independence (Decree of the President of the Russian Federation 2010).

Solving this problem requires the implementation of an innovative development scenario. Therefore, one of the tasks set in the Strategy for the Development of the Krasnodar Territory until 2030 is the development of innovation and investment infrastructure, including the promotion of the development of existing and the creation of new facilities (clusters, special economic zones, technology parks, industrial parks, business incubators, etc.). In the current situation, the most effective tool for innovative development and growth of the profitability of agricultural production is the creation and development of agricultural technology parks. The practice of their functioning in Russia and in foreign countries confirms their key role in the formation of a scientific and technical base for solving various problems of socio-economic development of territories (Lvov et al. 2019).

Therefore, the purpose of this study is to study the effectiveness of the creation and development of agricultural technology parks as a mechanism of scientific and industrial cooperation in the agriculture of the region. This objective has led to the following interrelated objectives:

- clarify the essential features of the concept of "agro-technology park";
- formulate goals and objectives, identify the types of effects from the creation and development of agro-technology parks;
- consider the forms of state support for agro-technology parks and determine the main directions for the development of their activities in the Krasnodar Territory.

2 Methodology

The information base for the research was compiled by the legislative and regulatory framework, documents of strategic planning for the socio-economic development of the region, monographs and scientific publications of scientists on the topic of research. The specificity of the object under study and the tasks set determined the use of such research methods as monographic, analytical, abstract-logical, etc.

3 Results

One of the directions of increasing the investment attractiveness of the economy of the Krasnodar Territory is the effective use of the innovative potential of economic entities in the agricultural sector. At the same time, as one of the priorities of regional innovation policy, an increase in the number of agricultural technology parks is distinguished (Law of the Krasnodar Region 2018).

In accordance with the regional legislation, the technology-park is a complex of infrastructure facilities (technological, communal and transport), which is designed to fulfill such tasks as the implementation of services for the placement and development of innovative business entities that are participants in the technology-park, as well as the launch and launch of high-tech products, services and technologies, including through territorial integration with institutions of science and education (Law of the Krasnodar Region 2010).

The formation of the technology park is based on the principle of integration of science, education and production in order to create, introduce and bring innovative products to the market through its commercialization.

Given the industry specifics, the agro-technology park carries out innovative activities in the agricultural sector of the economy. Within the framework of the agro-technology park, a single scientific and production association is formed, which is based on the development of mutually beneficial organizational, economic, technological and scientific ties between agricultural producers, research and training institutions in the process of implementing innovative projects (Melikhov et al. 2019).

Based on this, the modern agricultural technology park is a business, scientific and educational center that ensures the interaction of the business community, scientific institutions, authorities and development institutions in the process of developing and introducing innovations in the agrarian sphere of the economy.

Analysis of the research materials made it possible to formulate the following goals and objectives of creation and activity of agro-technology parks (Kuznetsova et al. 2020; Melikhov et al. 2019; Nazarenko 2016; Papaskiri and Ananicheva 2013) (Table 1).

Table 1 Description of goals and objectives of creation and activity of agro-technology park

Indicator	Content
Purpose	Promoting regional development through the promotion of innovative culture, commercialization of innovative projects and developments, production and promotion of knowledge-based products to the market, as well as the integration of scientific organizations and innovative business
Principles of organization of activities	Combining innovative agribusiness entities and necessary resources on mutually beneficial terms
	Equality of rights, duties and responsibilities of all actors in innovation
	Implementation of the system of measures to stimulate the implementation of innovative projects
	Provision of a set of necessary services to agro-technology park entities
Tasks	Development of research and development in the agricultural sector
	Development and implementation of large-scale investment projects based on innovative technical and technological solutions with high risk when they are implemented
	Introduction of Russian and foreign knowledge-intensive technologies in agricultural production
	Development of innovative entrepreneurship in the agricultural sector, simplification of creation and growth of innovative organizations
	Information support for innovation activities, effective exchange of knowledge and technologies between organizations participating in the agro-technology park
	Attracting investment in innovation promotion and sustainable self-financing of agrarian science
	Improving the skills of managers and specialists of agricultural organizations in the field of innovation

Source Compiled by the authors

Within the framework of agro-technological park infrastructure, the interests of various subjects of the territorial innovation environment intersect and the necessary conditions are created for their closer cooperation. Thus, agro-technology parks should contribute to the formation of new relations between science, the state and agribusiness in the process of implementing innovative projects. At the same time, the basis of the toolkit in the innovative development of the agricultural sector is the mechanism of public–private partnership (Kuznetsova et al. 2020).

Agro-technology park is the core of the innovation and investment agro-cluster and plays a key role in its functioning. The economic effect of the creation and development of the agro-technology park network will be expressed in increasing the efficiency of agricultural production and the competitiveness of agricultural products, including in increasing labor productivity, reducing energy intensity and cost of production. The organizational effect will be expressed in reducing the timing of the introduction of innovative developments and the implementation of innovative projects in the agricultural sector of the economy, social—in the creation of new jobs.

Krasnodar Territory has the capabilities to form and expand the agricultural technology park system. In the region there are strategically important agricultural organizations, specialized research institutes, higher educational institutions and pilot farms. It should be noted that some experience has already been gained in the region. Currently, 18 agricultural parks operate in the region, which include advanced agricultural farms, educational and research institutions. Agro-technology park subjects train qualified specialists and act as initiators and co-executors of innovative projects, including scientific research and experimental developments (Gaiduk and Nikiforova 2017).

The key link of regional agro-technology parks is large agricultural organizations with a large number of jobs, a developed material and technical base, which allows the integration of applied science and production and the effective implementation of promising innovative projects. All agro-technology parks actively interact with scientific and educational institutions (Lvov et al. 2019). So, the two largest and most successful agricultural technology parks—the Kuban and Krasnodar training facilities—operate on the basis of the Kuban State Agrarian University.

In order to regulate the activities of agricultural technology parks, regional legislation establishes a procedure for assigning and depriving the status of a technology park, a system for managing them, coordinating the activities of management companies and residents of technology parks, as well as assessing the effectiveness of their activities.

The following areas of state support for agricultural technology parks are provided in the Krasnodar Territory (Fig. 1).

However, despite the presence of significant investment and innovative potential in the region, it should be noted that a key aspect of improving the effectiveness of the formation and operation of the regional agro-technology park network is the strengthening of the role of the state, the direct active participation of regional and local authorities. Currently, most agro-technology parks are created on the basis of a mixed (public–private) form of ownership, in which the state is the organizer, and

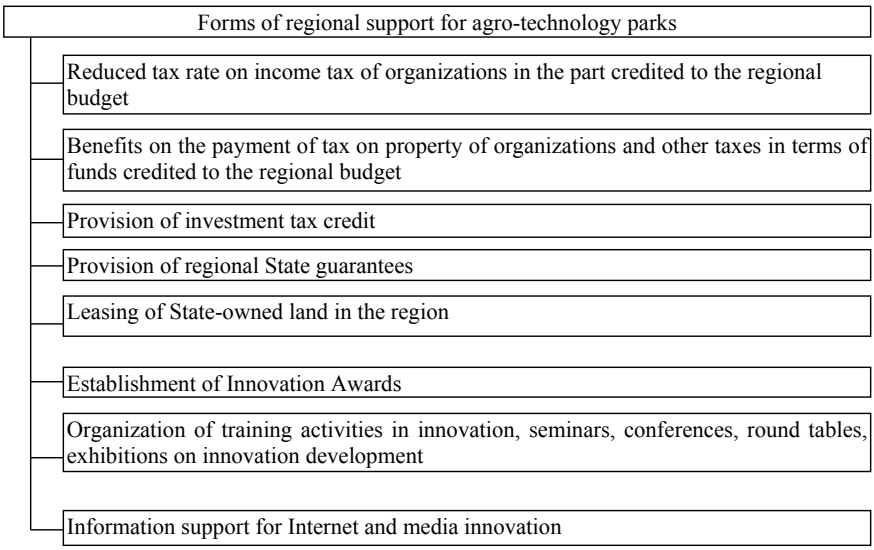

Fig. 1 Directions of state support of subjects of innovation activity in the Krasnodar Territory. *Source* Compiled by the authors

companies' resident in the technology park carry out entrepreneurial scientific and production activities (Papaskiri and Ananicheva 2013). Authorities in such a model should be responsible for providing land and premises for residents of an agricultural technology park, providing material and technical property, targeted financing, as well as cooperation between agribusiness entities. In order for agro-technology parks to perform the function of effectively reproducing the innovative potential of the region, it is necessary to constantly improve the mechanism of state support, including legal, financial, material, land, property, information, organizational and economic support.

Currently, one of the main aspects of regional development in accordance with the Strategy of the socio-economic region until 2030 is the cluster approach, in which the object of state regulation and economic management is not an industry or economic entity, but a territorial unit (Law of the Krasnodar Region 2018).

Therefore, agro-cluster is a set of interconnected industries that arise in the region in order to ensure competitive advantages for various types of agricultural products in relevant markets. At the same time, cluster policy provides that any territorial entity in the process of its development actively interacts with other territories, which also solve various problems in the process of their life. In this regard, regions and municipalities compete with each other in order to provide the best conditions for the population, as well as individual economic entities compete with each other in order to increase the profitability and profitability of their activities (Papaskiri and Ananicheva 2013; Trukhachev et al. 2020). At the same time, management bodies interact not with disparate organizations and entrepreneurs, but with territorial

clusters, whose subjects are united on mutually beneficial terms with the aim of joint and more efficient use of technologies, labor markets, storage, processing, marketing, transport, mechanization tools, elements of production infrastructure, etc.

Based on this, it seems advisable that agro-technology parks should become the basis of cluster policy and an instrument for its implementation in the agro-industrial complex of the region. According to many economists, in modern conditions, it is the cluster approach (in the form of agricultural technology parks) that represents the only possible way to develop agro-industrial complex.

4 Conclusion

Krasnodar Territory occupies a leading position in Russia in many indicators of the agro-industrial sector, in order to maintain and strengthen which it is necessary to support innovations in this area. In modern conditions, the most effective form of development of the agrarian economy and organization of innovation activities is integrated agro-technology park structures that ensure active interaction of production and scientific and technical potentials, increase the speed and efficiency of the innovation process.

The creation of agricultural parks is one of the key factors in the transition to an innovative model of the agricultural economy. The activities of agro-technology parks are based on the systematic integration of all elements of the development, implementation and commercialization of scientific achievements in the agro-sector, in such a way contributing to the formation of a mechanism for sectoral scientific and industrial cooperation. As a result of the development of the agro-technology park network, the necessary conditions will be created for highly competitive, export-oriented relations in the agricultural economy, for the transition of the industry from an extensive to an intensive type of development, including providing for an expanded reproduction of fixed assets.

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The Influence of the Ethnocultural Factor on Modernization Processes in the Regions of Russia (Using the Example of the Chuvash Republic)

Erbina V. Nikitina, Elizaveta M. Mikhailova, Tatiana N. Evgrafova, Christina V. Fadeeva, and Marina N. Grigorieva

Abstract The purpose of the article is to identify the relationship of modernization processes in Russia with the ethnocultural specifics of its regions, to determine the degree of effectiveness of the state's innovation policy in the regions on the example of events that took place in the Chuvash Republic in 2018–2020 in connection with Chinese investments in the framework of the international infrastructure project "New Silk Road". In the Russian Federation, modernization is a set of regional upgrades. In different regions (the North Caucasus, the Middle Volga region, the Far East, Siberia, etc.), different dynamics of socio-economic and political development are observed, which is largely due to cultural traditions, religious ideas, the specifics of the economic system and the peculiarities of the mentality of indigenous peoples. The authors rely on the analysis of socio-philosophical and historical-cultural texts published in Russian over the past ten years and devoted to the problem of modernization of Russia, attract data from sociological surveys, and also use content analysis of thematic publications in the media and the Internet, including social networks. Protest actions of the Chuvash population in certain areas of the Chuvash Republic, the Ulyanovsk Region and the Republic of Bashkortostan in 2019 regarding the transfer of mutual lands for use by foreign investors demonstrate a direct dependence of modernization processes on the ethnocultural factor. When conducting investment policy in the agricultural sector, the leadership of the Chuvash Republic did not take into account the peculiarities of the ethnic mentality

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of the Chuvash, who are historically an agricultural people and make up the majority of the population of Chuvashia. Ignoring the ethnocultural factor has led to social tensions in the region. A comparative analysis and synthesis of the regional ethnocultural characteristics of the peoples of Russia make it possible to see in a new light the impact of ethnicity on the effectiveness of social, economic and political transformations. The results of the study are also of practical value: they can be taken into account when making administrative and managerial decisions related to the differentiation of modernization tasks in different regions of the country.

Keywords Russian modernization process · National modernization · Ethnic regions · Chuvash republic · Ethnic culture · Agriculture · Chinese investor

JEL Code J88 · J15 · J52 · J43 · Z1 · Z13 · Z18

1 Introduction

The relationship of the modernization processes of the country with the ethno-cultural specifics of its regions is one of the relevant topics of Russian humanitarian science. As Pain notes (2011), in relation to Russia, the word "modernization" should be used in the plural, because in its different areas, in the North Caucasus and Central Russia for example, modernization processes will inevitably differ in goals, content and timing. On the one hand, regional modernizations should focus on the cultural and historical specifics of regions and their role in Russian society, and on the other, do not contradict national modernization, obeying its principles and laws (Aliev 2014; Mikhailova 2010).

Each Russian region has its own competitive advantages and flaws that affect the success of state reforms. Administrative and managerial decisions related to the differentiation of modernization tasks take into account mainly socio-economic indicators and very rarely ethno-cultural and ethno-mental ones. Regional features, special economic structure, peculiar culture and specifics of ethnic mentality are considered by the authorities not as a support or incentive to change, but only as an object of transformation or an unfortunate obstacle to modernization (Borodin 2013).

Taking into account modern concepts, in particular the concept of the "national model of modernization" (Fedotova 2016), this is incorrect both practically and theoretically. Unified, unintelligible modernization, superficial attitude to ethnic traditions and moral and religious ideas determine the artificial opposition of "their" and "strangers," "old" and "new" worldviews, ideas and value paradigms. This inevitably leads to inter-ethnic and religious conflicts in a single State, as well as to social risks and threats of social tension in certain regions.

2 Materials and Method

The research is based on the analysis of socio-philosophical and historical and cultural sources published in Russian in the 2010s and devoted to the problem of modernization of Russia: Aliyev (2014), Allardt (2002), Belyaeva (2014), Borodin (2013), Fedotova (2016), Kanarsh (2020), Mergel (2012), Prateek (2010), Vishnevsky (2006) etc. Content analysis of thematic materials in the media (Idel.Realities [Idel.Realii] 2020; When the Earth Cries 2019), publications on official Internet portals (Portal of the Authorities 2019; Sichuan-Chuvashia 2020) and on social networks (Madurov 2019) are used. Data from sociological surveys and studies are used (Boyko et al. 2011).

According to Sineokaya (2018), the processes of modernization and archiving in the modern world take place in parallel, and a single universal system of values and worldviews does not automatically and painlessly arise as a "natural consequence" of economic globalization. Despite the importance of the innovative development of the economy, the creation and introduction of new technologies, ideas and products, the main object of the modernization process is society itself, and the success of modernization projects depends, first of all, on the adequate perception of them by the population, said Borodin (2013). As a particularly significant factor and determinant of social development, moving the mode of production and economy to the background, culture, mental and religious elements of the spiritual existence of peoples are put forward (Bilalov 2015). It is in this vein that "ethnic culture and national psychological prerequisites are used in the modernization of non-Western countries (for example, China, Japan, Asian "tigers") (Kanarsh 2020).

3 Results

For comparative analysis and generalization of the influence of ethnocultural and ethno-religious factor on modernization processes in ethnic regions of modern Russia, a single research model is needed. Such a generalized analysis of ethno-social and ethno-cultural processes in ethnic republics (for example, in the Republic of Dagestan, the Chechen Republic, the Chuvash Republic, the Republic of Tatarstan, the Republic of Bashkortostan, the Republic of Sakha (Yakutia), etc.) is interesting in that it is here that the most striking form manifests the problem of the ratio of modernization (techno-genic) and traditional principles in Russian society. In addition, these regions are the territories of contact of various socio-cultural worlds—Russian and Turkic, Orthodox and Islamic, Western and Eastern.

However, it should be noted that at present in Russia, when implementing modernization transformations, ethno-cultural features and the specifics of the mentalities of peoples are extremely poorly taken into account. One of the evidence of this is the protest actions of the indigenous part of the population of the Chuvash Republic in 2019 on the issue of transferring mutual land to Chinese investors for long-term

use. Residents of the Chuvash villages of Ekhvetkasy of the Morgaushsky district and Krasnaya Gorka of the Tsivilsky district of Chuvashia opposed the construction of a milk processing plant with Chinese participation, although at the same time in the Poretsky district of the republic, inhabited mainly by Russians and Mordovians, the Sichuan-Chuvashia company (Sichuan-Chuvashia 2020) successfully began to cultivate land for growing cows.

A similar situation was observed in 2019 in the Belebeyevsky district of the Republic of Bashkortostan, in which 13.5% of Chuvash live. Residents of Chuvash villages Slakbash and Krasny Yar opposed the construction of a Chinese pig complex on their reserve land (When the Earth Cries 2019). Meanwhile, similar livestock complexes are already operating in the Blagovarsky district of Bashkortostan, where mainly Bashkirs, Tatars, Russians and Ukrainians live.

At the moment, the agro-industrial trading company LLC "Sichuan—Chuvashia" is experiencing difficulties not only at the level of the population of Chuvashia, but also in relations with local government bodies. If in 2019, with the assistance of the Ministry of Economic Development and Trade of the Chuvash Republic, the Chinese investor signed an agreement with the Chuvash owner on the preliminary sale of the site for the construction of a processing park, then in 2020 the owner sold the land to another company without prior notice to the investor. For three years, no suitable land was allocated for the construction of the Sichuan-Chuvashia agro-technology park. Representatives of the Sichuan-Chuvashia company explain the failure of their investment campaign in Chuvashia as follows:… "after gaining negative experience with local state bodies, we come to the conclusion that we cannot hope only for local authorities, and we simultaneously work in other areas. Our big mistake is that we, not knowing the local mentality, "trusted" the actions and advice of individuals who made impossible promises and do not have sufficient knowledge about the business process in China (Sichuan-Chuvashia 2020).[1]

By "local mentality" is meant the ethnic mentality of the Chuvash, who are the "titular" nation of the Chuvash Republic. The specificity of their mentality is due to the cultural, historical and socio-economic characteristics of the region. Chuvashia is a region with a favorable location and historically established agrarian-industrial specialization, but, unfortunately, its economy is characterized by a depressed nature of development due to the lack of strategically significant raw materials, due to proximity to the leading regions, negative demographic dynamics, migration outflow of the economically active population (Gavrilova and Danilova 2019). Significant poverty in the region and low wages for agricultural work also affect.

In 2019, the Chuvash Republic was included in the list of Russian regions with a low level of socio-economic development. The draft program of the Chuvash Republic exit from the current situation involves increasing investment attractiveness, development of agriculture and industrial potential of the Republic, implementation of corporate programs to increase competitiveness of industrial enterprises of

[1] In the Volga media, the village of Ekhvetkasy, whose residents did not allow representatives of the Sichuan-Chuvashia company to acquire their land, was dubbed "a symbol of resistance to Chinese economic expansion" (Idel.Realities [Idel.Realii] 2020).

the Republic, etc. (Portal of the Authorities of the Chuvash Republic 2019). Chinese investments in the agriculture of Chuvashia are considered in this project as one of the areas of economic growth.

4 Conclusion

Investments from China in the Chuvash agro-industrial complex accompanying the construction of the Europe-Western China highway as part of the "New Silk Road" international infrastructure project are considered to contribute to the modernization of the region.[2] However, when implementing Chinese investment projects, local authorities made mistakes that did not take into account the peculiarities of the ethnic mentality of the Chuvash. Obviously, the government of the republic did not expect resistance from the local population, although ethnic experts predicted that the Chuvash, historically an agricultural people, could oppose the "seizure" of their lands by foreign investors. In particular, the Chuvash historian and cultural specialist Madurov (2019) emphasizes that the Chuvash have always been farmers, and "taking land from us, Chuvash, means depriving us of the livelihood and the very future of the people. Naturally, the people will protest". Love for the land and work on it are one of the basic elements of the centuries-old Chuvash mentality (Evgrafova 2014; Nikitina 2014), and the Chuvash, more than the Russians, have a noticeable orientation towards settlement and regional identities (Boyko et al. 2011).

In our opinion, effective modernization is impossible without taking into account ethnic characteristics, and this should be envisaged in the development of a national development strategy. In this regard, it is preferable not so much to realize the "imperative of changing the national mentality," but rather to take into account the peculiarities of the national character that each people has and dialectically connect the "strong" and "weak" sides of it, according to Kanarsh (2020). In this regard, the study of ethno-cultural features based on a historical and cultural approach, their influence on the processes of socio-economic and political development of the regions can serve as the basis for the development of an effective concept of a national model of modernization in specific conditions of multinational Russian reality. Otherwise, you can get fireworks for conflict situations in which socio-economic problems will be complicated by inter-ethnic ones.

[2] According to the organizers of the "New Silk Road" project, which passes through eight constituent entities of the Russian Federation - Moscow, Vladimir, Nizhny Novgorod, Samara, Ulyanovsk regions, the Chuvash Republic, the Republic of Tatarstan and the Republic of Mordovia, the implementation of the project will have an economic effect by creating thousands of new jobs and increasing business activity (Ulpressa 2020).

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Functioning of HCC: Industry Dynamics and State Support for Activities for the Sustainable Development of the Regions of the Russian Federation

Valentina A. Rudenko, Tatyana S. Popova, and Elena E. Udovik

Abstract The scientific article is devoted to the consideration of the peculiarities of the functioning of housing and construction cooperatives as a modern form of uniting people or organizations for the purpose of building housing, managing it, as well as key aspects of state support and regulation of the activities of the GCC. The novelty of the implemented research consists in studying the existing practice of creating housing and construction cooperatives and analyzing the prospects for cooperation of state regulation and market self-government in housing and communal services in Russian regions in the interests of their sustainable development. The methodological basis of the study was the fundamental works of Oranova and Zavakina (Problems and prospects for the development of housing construction in modern conditions 2016, pp 84–87.), Stepchenko and Voronova (Russian Newspaper 2020), Sukharev (2019, pp 897–899.), Shavyrina (Signs of a housing and construction cooperative 2019, pp 387–394) and other scientists.

Keywords Regional economy · Regional real estate market · Housing commissioning · Sustainable development · State support · Housing construction cooperative

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1 Introduction

According to Federal State Statistics Service, in September 2020, 7.8 million square meters. m. Housing. According to data provided by RIA Novosti, the volume of housing commissioning in the country in September 2020 increased by 18.4% compared to the same month of 2019, to 7.8 million square meters, which is the largest monthly indicator this year. In September, 694 apartment buildings were erected in the country. This is 11.9% more than in 2019. The number of individual residential buildings increased by 31.4% (up to 1.81 thousand). Over the nine months of this year, 47.8 million square meters of housing were built in the Russian Federation, which is lower than the figure for the corresponding period of last year by 2.3% 0.22.7 million square meters was for apartment construction—minus 3.8% by 2019, 25.1 million was for individual housing construction—minus 1.5%.

The construction industry, albeit not rapidly, is recovering from the consequences of the first wave of the pandemic. Housing commissioning continues to grow in almost all regions of the country of the Russian Federation. Already in August of this year, the commissioning of housing, which was previously influenced by the pandemic, returned to growth, and which slowed down in the spring due to strict universal restrictive procedures.

The spring recession, which had an impact on all industries without exception, did not bypass construction. But the analysis of data on the commissioning of housing for August and September 2020 indicates that. The construction industry has found growth reserves, mobilized all efforts and quickly returned to normal work. Timely measures deployed by the Government of the Russian Federation and the Bank of Russia to support the economy contributed to this.

It is also worth noting that simultaneously with the quantitative increase in the introduced housing, the volume of launch of new projects in construction increased. The state seeks to find opportunities and potential to maintain such an important systemically important industry as construction in such a difficult period (RIA-Novosti 2020)

2 Methodology

Initially, at the beginning of the twentieth century, when such a form of cooperation as HCC was just emerging in the bowels of the construction market, there were more cooperatives in Russia than in any country in the world. Housing cooperation, which was designed to realize the housing interests of citizens, was also actively developing in the Soviet space. However, in the 90s, when the consequences of the protracted economic crisis enveloped the country, the point of view arose that it was necessary to develop the housing market at the expense of borrowed funds from banks. Therefore, the well-known word “mortgage” has come into the everyday life of citizens to date. Can a mortgage be considered a way to provide all those in need with affordable

housing? The question is rhetorical. Mortgages are not available to all citizens, and there are many different reasons for this.

In this regard, the once forgotten form of housing and construction cooperation (HCC) began to gain momentum. And its essence lies in the fact that those who establish a cooperative gradually accept new participants (members of the HCC) into its composition, and those in turn make mutual contributions. With these accumulated funds, the construction of the house continues. Upon completion of construction, those members of the housing and communal services who have paid their contributions in full receive the right to state registration of property rights.

You can build housing in Russia by teaming up with other equity holders. One of these forms of associations is called a housing and construction cooperative. HCC—it is by such an abbreviation that the community is known among Russians. The constituent organization is created for the purchase and management of areas of an apartment building.

It is worth noting the fact that we do not yet have a specific law that deals exclusively with the functioning of housing and construction cooperatives. Perhaps this is a matter of time, and in the meantime the activities of housing and construction cooperatives are regulated by the FZ-214 "On participation in shared construction…" and 161-FZ "On the promotion of housing construction." In addition to the designated laws, certain issues related to the regulation of housing and communal services can be found in the Civil and Housing Codes of the Russian Federation.

The functioning of the HCC is regulated not only by law, but also by its charter.

The shareholder, when joining the HCC, must comply with this charter (Oranova and Zawakin 2016).

Now not all housing and construction cooperatives have the right to carry out construction using the funds of their members. Below are the categories of HCC's that are endowed with this possibility:

- created according to law 161-FZ—so-called housing cooperatives with the state support which members can be separate categories of citizens;
- created in accordance with the law 127-FZ "On insolvency (bankruptcy)." In this case, for the completion of the problem house, the rights to the land plot and to the unfinished construction object itself are transferred to a housing and construction cooperative created from participants in shared construction;
- housing and construction cooperatives that have received building permits before the 01.07.2018, which is currently not finished, and houses for some reason have not yet been put into operation in the manner established by the legislation of the Russian Federation on urban planning activities.

Since September 25, 2019, housing and communal services leading the construction of residential buildings are required to register on the nash.dom.rf portal and permanently post current information in the UHIS (Unified Housing Information System). Control over the fact and completeness of placement of relevant information by housing and construction cooperatives in the UISZHS is provided by authorized executive authorities of those constituent entities of the Russian Federation on

the territory of which such housing and communal services build houses. The placement of HCC information in a single UHIS will provide even greater transparency of housing construction for citizens and all participants in the housing sector.

3 Results

In Soviet times, cooperatives were a familiar form of solving the housing problem. Today, cooperatives are returning their importance - this is a promising form of solving the housing problem (Stepchenko and Voronov2015).

In 1997, by a decree of the Government of the Russian Federation, a financial institute for development in the housing sector, Dom.RF, was created to promote housing policy. As a result of its work, this company develops areas that in turn allow for the purchase of housing to create favorable conditions, develop the urban environment, and form a civilized rental market. Thanks to all this, the level of sustainable development of the regions included in the Russian Federation is increasing.

The activity of the Dom.RF is aimed at creating cost-effective scalable mechanisms for the development of the housing sector, which make it possible to increase the availability of housing for Russian citizens and solve social problems in the framework of providing the country's population with housing. To this end, the Dom.RF assists in the development of mortgage lending and housing construction, involves federal lands for the integrated development of territories, and also monitors in the field of housing construction.

As part of the involvement and provision of unused and inefficiently used land plots under federal ownership, Dom.RF transfers land to the regions for large families. Since 2012, 44 regions have been transferred plots of 10.6 thousand hectares, 21 regions have provided 19.75 thousand plots to large families.

During the period of activity of a single institute of development in the housing sector, in accordance with the requests of the heads of the constituent entities of the Russian Federation, the powers of the Russian Federation to manage and dispose of land plots with an area of 7.7 thousand hectares for housing construction were transferred to the regions, including to solve the problems of affected citizens participating in shared construction.

Dom.RF also transfers land for the construction of housing and construction cooperatives with state support for certain categories of citizens. A housing and construction cooperative with state support is an association of people or organizations for the purpose of building housing, as well as for housing management.

As part of the HCC with state support, "Dom.RF" donates land-plots of HCC from federal or unrestricted property. Free land allows you to reduce the cost of housing to 60%. There are certain categories of citizens who can join the housing and communal services with state support—these are doctors, teachers, military personnel, scientists, internal affairs officers, civil servants, large families. The Development Institute intends to apply to the Russian Government with an initiative to expand the categories

of citizens-members of housing and construction cooperatives in order to give more people the right to enter the housing and communal services and build housing.

The money of members of the housing and construction cooperative goes only to pay for the costs associated with construction. At the same time, members of the cooperative can independently control design and construction work, avoiding unreasonable costs. The land can be registered in ownership.

At the moment, with the participation of Dom.RF, 113 projects of housing and construction cooperatives are being implemented in 46 regions. 725 hectares have already been provided to 76 cooperatives. Within the framework of 14 projects, 143 thousand square meters meters of housing. On average, the cost of housing in housing and communal services with the participation of Dom.RF is 30% lower than the market. In this regard, it is worth emphasizing the need to replicate experience in the use of federal lands in order to provide for housing and communal services, including on land under municipal and regional ownership.

Now the regions must report on the protection of the rights of shareholders who bought apartments through the same housing and communal services. Such an obligation was imposed on them by the Russian government. Equity holders are allowed to independently put the new building on cadastral registration. Local authorities should now report on solving the problems of shareholders who purchased apartments through housing and communal services. The corresponding order has already been signed by the Prime Minister of the Russian Federation Mikhail Mishustin.

Regional leaders should draw up "roadmaps" to solve the problems of defrauded equity holders, where it is necessary to indicate a list of problem houses and unscrupulous companies, the number of victims, measures, methods and deadlines for restoring their rights. Regional leaders need to update the roadmap once a quarter and place it in the Unified Housing Information System on the nash.dom.rf website.

By concluding an agreement with a housing and construction cooperative, a citizen acquires only a share, but does not acquire the right of ownership of an apartment or the right of claim to the developer to transfer the object of shared construction, The right of ownership of the apartment is allowed to be issued only after full payment. This requirement is provided for by the 478-FZ, which was adopted at the end of 2018. In order to execute it, the personal account of the housing and communal services began to function on the corporate website of the Dom.RF. In it, each of these organizations must post data:

- about himself;
- on houses under construction by housing and communal services;
- Members of the cooperative at whose expense the construction is carried out (Russian Newspaper 2020).

At present, it is difficult to assess the practice of housing and construction cooperation as a market mechanism, for the reason that the current regulatory framework does not allow this scheme to be used in any possible and desired cases. In addition to this, the functioning of HCCs is under the direct control of the state, which again does not contribute to the use of these practices as a market mechanism.

There is every reason to believe that greater public participation is needed in cooperative affairs. The basis could be taken from the positive experience of Germany—where the state finances a significant share of HCC mutual funds. State participation must be determined at the federal level.

The standard purchase of real estate in the primary and secondary markets is expensive for an ordinary resident of the country. You can save if you draw up an equity agreement or join a housing and construction cooperative, that is, actually buy housing at the construction stage. Many people in Russia have a rather poor quality of housing conditions or with a huge mortgage deposit for 15–20 years. It is impossible to solve this problem by reducing mortgage rates. But there are other ways—state subsidies, the use of other ways to assist the state in acquiring housing. It is necessary to create conditions for the prosperity of housing and communal services, free land with infrastructure, forests for the construction of houses throughout the country (Sukharev2019).

4 Conclusion

Citizens of our country, whose plans include improving their housing conditions, can unite in cooperatives. The regulatory framework in this area recognizes several types of self-organization as effective forms of such cooperation. It is assumed that those people who have decided that it is easier to solve the housing problem together can join a housing savings cooperative. For this form of self-organization of citizens, there are strict rules for controlling the expenditure of funds that are supposed to be spent on construction. Housing and construction cooperatives are so far a less sought-after form of cooperation, possibly because people hear frequent stories with deceived investors. But those rules and procedures that regulate the activities of housing and communal services have recently begun to improve markedly, putting forward this format as a reliable choice for the client. It is important to note that over the past few years, state support for housing and communal services at the regional level has noticeably increased, which makes this form of association of citizens more and more popular in the real estate market.

The implementation of the infrastructure type of development of regional real estate markets makes it necessary to replicate existing best practices in the use of federal lands in order to provide housing and construction cooperatives, including municipal and regional land. It is important to take initiatives to expand the categories of citizens who have the right to create HCC.

Cooperatives can play an important role in solving the housing problem for the sustainable development of the regions of the Russian Federation. However, the situation with the functioning of housing and construction cooperatives is not yet ideal. Cooperatives need State support, including direct public funding. As for strengthening the role of the state and increasing state support, the legislative framework should, first of all, protect cooperatives, a law on housing cooperation is needed, which determined the life, including types, boundaries of state support. At the federal

level, the balance of the personal interests of citizens and the interests of the state in terms of housing reform should be resolved. It is the achievement of a balance of interests in this matter that will lead to the development of regional housing markets. The status of housing cooperatives needs to be consolidated as a priority means of addressing the housing problem and as a vector of sustainable regional development.

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Territorial Development Based on Increasing the Competitiveness of Agricultural Consumer Cooperatives in the Republic of Tatarstan

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Abstract The presented article explores the problem of territorial development by increasing the competitiveness of enterprises of agricultural consumer cooperation on the example of the Republic of Tatarstan. According to the authors, the development of agricultural cooperation can give an impetus to increasing the economic potential of the region, will solve the problem of food security of the Russian Federation, stimulates the development of national agriculture. The research highlights the main problems that hinder the development of agricultural cooperation in Russia, including the low competitiveness of these enterprises, insufficient knowledge and weak motivation of the population to create a cooperative movement, the lack of effective state support for agricultural producers by regional and federal authorities, as well as policies pursued by large trade retailers that are aimed mainly at increasing agricultural imports. The authors propose a comprehensive approach to solving these problems, highlighting several main priority areas. At the same time, the first task is to increase the competitiveness of consumer cooperation enterprises and their products. An analysis of the activities of enterprises of agricultural consumer cooperation in the Republic of Tatarstan is carried out and recommendations are proposed to increase the competitiveness of consumer societies, in particular, to create a wholesale distribution and logistics link of cooperation, reduce costs, and optimize the assortment.

Keywords Consumer cooperation · Competitiveness · Territorial development · Cost optimization · Agricultural products

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1 Introduction

In the process of implementing the strategy of socio-economic development of the Republic of Tatarstan, a key factor may be to increase the competitiveness of agricultural enterprises and, in particular, agricultural consumer cooperatives. Currently, in Russia, the issue of preserving and scaling such an organizational and legal form of enterprises as agricultural cooperatives is acute. The development of agricultural cooperation can give an impetus to increasing the potential of rural areas, will solve the problem of food security of the Russian Federation, and stimulates the development of national agriculture. In our opinion, the main problems hindering the development of agricultural cooperation in Russia are the low competitiveness of these enterprises, insufficient knowledge and weak motivation of the population to create a cooperative movement, the lack of effective state support for agricultural producers by regional and federal authorities, as well as policies pursued by large trade retailers that are aimed mainly at increasing agricultural imports.

In our opinion, the solution of these problems should be approached in a comprehensive manner, highlighting several main priority areas. However, increasing the competitiveness of consumer cooperatives and their products is a priority that cooperators themselves must address. The proposed article discusses some ways to increase the competitiveness of consumer societies on the example of consumer cooperation of the Republic of Tatarstan.

2 Materials and Methods

The presented article is based on the synthesis, analysis and structuring of data on consumer agricultural cooperatives of Tatarstan provided by the Tatar Consumer Union of the Republic of Tatarstan. This article is based on the authors' independent conclusions, as well as the results of processing the study materials of other authors. The article considers theoretical and practical aspects of formation of competitive advantages of Russian regions and enterprises on the basis of development of innovative relations. Based on the analysis, sources and factors of creation of competitive advantages in modern production and social systems in conditions of technological multilevel were identified (Nasretdinov 2017). The research suggests that the competitiveness of the regional system is an integral indicator, depending on many factors, one of which is the effectiveness of rural development. In turn, the development and competitiveness of agricultural consumer cooperatives, which are an integral part of the agricultural cluster, can affect the effectiveness of territorial development. When performing scientific work, the authors used logical and complex approaches to the study of facts, methods of structuring, generalization and analysis were applied.

3 Results

The competitive advantages of the entrepreneur are manifested in the process of interaction, interaction and struggle in the market with other business entities. In modern conditions, increasing the competitiveness of consumer cooperation enterprises is possible by the consumer societies themselves and depends on the effectiveness of the management system. Consider the main challenges and ways to increase the competitiveness of agricultural cooperatives.

1. One of the problems of the low competitiveness of consumer societies is the high costs of small cooperatives for logistics operations and, as a result, quite high prices for goods that cannot always compete with the dumping price policies of retail chains. In this regard, one of the ways to increase competitiveness is the establishment of bilateral strong ties between consumer societies and producers, which, in turn, will contribute to a faster and more effective solution of the economic and social problems facing consumer cooperation, the development of a wholesale link of consumer cooperation and the improvement of logistics processes. To date, 56 consumer cooperation enterprises have been registered in Tatarstan, we believe that the creation of inter-district wholesale trade enterprises will help establish cooperative ties, diversify the range of products in retail trading enterprises, and save small cooperatives from the need to maintain a large transport fleet and warehousing places.
   When creating a logistics and wholesale structure in the system of consumer cooperation, increasing competitiveness and strengthening the social orientation of cooperative entrepreneurship occurs in several development vectors at once:

   - attraction of new skilled labour resources to this sphere of the economy in order to continuously develop it and increase competitiveness and attractiveness for small businesses;
   - a significant reduction in the costs of production and circulation of consumer cooperation enterprises, which will lead to the attraction of new consumers due to lower prices for industry products;
   - increasing the turnover of activities, and as a result, profit and profitability of consumer societies, increasing the income of members of consumer cooperatives.

The proposed measures can accelerate the development of consumer cooperation and increase the efficiency of its wholesale and logistics link. At the same time, increasing the importance of the role of wholesale structures in the system of consumer cooperation will lead to a decrease in the working capital spent and the costs of consumer societies. Improving procurement and supply logistics through procurement through the wholesaler is a prerequisite for the efficient operation of the wholesale structure; clear planning of sales volumes on the part of consumer companies, centralized deliveries, as well as centralized deliveries.

Let's give an example: 2 manufacturers produce a specific product of this group, and only 4 retail outlets take it for sale. Possible options for the delivery of goods can be clearly represented as follows:

The first option. The marketing policy of consumer cooperation enterprises excludes intermediate links and each store can interact with manufacturers of goods, without the participation of intermediaries—directly. The use of such a system of exchange of goods leads to the fact that the total number of connections between producers and sellers is more than with the participation of the wholesale and logistics link and is equal to the product of the number of producers per number of sellers, i.e. $2 \times 4 = 8$;

The second option. Suppose that there is one wholesale intermediary between any manufacturer and store, then the number of links will be calculated as the sum of the number of manufacturers and the number of consumers, i.e. $2 + 4 = 6$. This sales policy option is more effective because it reduces the number of interactions that harmonize supply and demand.

These options demonstrate the efficiency of logistics operations and economies of scale by combining sales offerings from more vendors. The use of wholesale intermediaries allows you to carry out additional operations, such as packing, packaging, delivery and storage, as well as increase the volume of operations to a greater extent than an individual manufacturer can allow. At the same time, transaction costs are reduced, since the costs of the wholesale intermediary are distributed to several manufacturers, and they, in turn, do not need to have their own supply personnel.

The organization of the sales system through the intermediary link also provides advantages such as reducing the functional discrepancy between deliveries and customers, ensuring the storage and breakdown of large quantities of goods into smaller batches, more convenient for manufacturers and consumers to the scale of deliveries. Since in the absence of intermediaries, manufacturers will have to sell goods in smaller batches in order to adapt to the volume of orders received from individual buyers. In addition, it needs to create inventory, increasing his storage costs. Improving logistics processes will also require additional transport.

2. Moreover, one of the directions of increasing the competitiveness of cooperative organizations is to increase the profits of enterprises of the consumer cooperation system by reducing costs. In our opinion, it is necessary to thoroughly analyze the main objects of expenditure in the structure of consumer cooperation. In our view, costs such as:

   - remuneration of administrative and managerial personnel. Analyzing statistics on the payroll fund and the number of employees at the enterprises of the Tatarstan consumer cooperation for 2015–2019, the following trends can be identified: in 2015, the total number of employees of consumer cooperation was 3025 people, of which 128 people were heads of various levels, and 127 people were specialists in the field of accounting and financial and economic activities. In 2019, the total number was 2552 people, of which 301 people were heads of various levels, and 152 people were among specialists in accounting, and 115 people were currently employed in financial and

economic work. That is, in five years, with a decrease in the total number of consumer co-operation workers, the number of executives and accounting specialists is growing. In addition, the reduction of the wage fund can be carried out by transferring part of the work on the accounting and financial and economic direction to outsourcing. This will reduce both the wage fund and tax payments from the wage fund.

- maintenance of premises, structures and administrative buildings. Optimization of maintenance costs of buildings and structures should be carried out in such a way as not to cause damage to their further operation. At the same time, the reduction in costs for their maintenance should not affect the decrease in the cost of buildings and structures, both in the real estate rental market and in the purchase and sale, the deterioration in the quality of service, the appearance of claims by property users;
- expenses for the purchase of office equipment, stationery, workwear. This item of expenses, although it has a small share in the total amount of costs, is nevertheless quite tangible for small enterprises. Reducing these costs can be achieved, for example, by combining orders of several consumer societies and buying a large batch at a wholesale price, and a rational approach to the use of consumables is also needed.
- hospitality and travel expenses. To minimize these costs, it is advisable to estimate them by the number of actual transactions and the amount of profit from these activities;
- payment of communication services, etc.

Therefore, each consumer society needs to analyze its expenses and, based on the result, identify the most costly objects of expenses and possible reserves for reducing these expenses and develop measures for their implementation.

3. One of the problems of consumer cooperation enterprises, in our opinion, is a rather narrow assortment of the offered goods. We believe that it is necessary to actively optimize the assortment by attracting new suppliers and deepening the assortment in various product groups. For example, cooperatives for the production of beekeeping products can diversify the assortment due to various natural flavors, make whipped honey, make medicinal, cosmetic and biologically active additives from related products, improve the packaging of goods, etc.
   In addition to selling dishes in stationary places of consumption (cafes, canteens), catering enterprises could offer finished products and semi-finished products for sale in stores or cooking departments. Today, the number of consumer catering enterprises in the Republic of Tatarstan is 55, with restaurants—2, cafes—28, canteens—7, buffets—6, cooking stores—5, individual workshops—6. We believe that it is advisable to increase the number of enterprises selling semi-finished products and finished products that will be in demand among residents of the regions of the republic, selling goods with low margins.
   In addition, you need to evaluate the key items in the assortment, analyze the assortment policy of competitors, track dynamic indicators in changing demand,

and increase the requirements for the quality of the assortment. Also, consumer cooperation enterprises should modify price policies in view of the service of certain groups of consumers (mainly people with low incomes), and changes in consumer demand.

4. In order to improve the competitiveness and efficiency of consumer cooperation enterprises, it is recommended to increase financial discipline through the reduction of receivables. Currently, many Tatpotrebsoyuz enterprises have an increase in this indicator, which negatively affects the work of consumer societies and leads to a decrease in working capital and solvency of enterprises. The effective organization of work on the liquidation and management of receivables will make it possible to increase the level of competitiveness of consumer cooperation enterprises.

Recommended activities include:

- to develop regulatory documents where to provide penalties for violators of financial discipline, establish strict terms of repayment of debt or form a mutually beneficial compromise solution, terms of payment of debt for both parties;
- sequestration of counterparties on the principle of financial solvency, introduce restrictions on deliveries or termination of customer service until the full payment of existing debt;
- in some cases, develop a procedure for recourse to the judicial authorities to collect debt from the debtor.

4 Discussion

In the course of this research, it was revealed that it is possible to improve the competitiveness of enterprises of agricultural consumer cooperation by various methods, including by creating and developing logistics and wholesale distribution centers for the sale, storage, processing and packaging of agricultural products, optimizing costs and assortment policies, keeping records of financial transactions and minimizing receivables. However, the activities of consumer cooperation in the Republic of Tatarstan are multidisciplinary and multifunctional. In this regard, it seems that for each of the enterprises of the consumer cooperation system of Tatarstan it is necessary to conduct an analysis of financial and economic activities and, based on its results, develop recommendations and measures to increase competitiveness for a particular consumer society.

5 Conclusions

In such a way, in this article, the issues of territorial development of the Republic of Tatarstan were investigated through the lens of increasing the competitiveness

of enterprises of agricultural consumer cooperation; measures were proposed to increase the competitiveness of consumer societies, in particular, to create a wholesale distribution and logistics link of cooperation, reduce costs and optimize the assortment.

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The Enterprise of Consumer Cooperation in Ensuring Regional Food

Olga V. Kaurova, Alexander V. Tkach, Maribel Santiesteban Perez, and Alexander N. Maloletko

Abstract The relevance, novelty and socio-economic significance of consumer cooperation in ensuring food security of regions and the state is argued by the relevance of the scientifically sound and effective use of the economic potential of consumer societies of the Central Union of Russia. The purpose of this work is to identify the main parameters and vectors of the activities of the consumer cooperation in the field of creating agri-food reserves, to reveal the peculiarities of the work of cooperative organizations in the field of procurement of agricultural products and wild plants, to identify the place and role of regional cooperative societies and unions in the system of food security of the state. The article considers the role and importance of the organizational and economic activities of consumer cooperation in food supply, the place of agricultural entrepreneurs and cooperative organizations in the formation of food resources in the regions, justifies the need to develop consumer cooperation in procurement and marketing activities, stimulate increased agricultural production, increase the efficiency of cooperative organizations, and increase competitiveness. The long-term activity of consumer societies of regions and unions of the constituent entities of the Russian Federation in the field of procurement, processing and sale of food products, the development of the social sphere and organizational and economic infrastructure in rural areas, which contributes to the growth of food production, raising the standard of living of the rural population, is summarized.

Keywords Consumer cooperation · Food security of the state · Agricultural products · Regional consumer societies · Food procurement · Food supply · Competition

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1 Introduction

One of the main directions in the organizational and economic activities of consumer cooperation in Russia is the process of purchasing, processing and selling food products. In this area of activity, a significant part of rural harvesters in the consumer cooperation system is employed. They operate traditionally on a large scale, especially during the harvest period, when the purchase price for agricultural products is much lower, which allows cooperators, after processing, packing, storage and sale at a later date at the expense of the created added value, to profit from cost recovery. Acting in the constituent entities of the Russian Federation, consumer cooperation by its activities organically fits into the economy of the regions. The entrepreneurship of cooperation is manifested in many areas of the life of the production structures of the regional economy. The effect of consumer cooperation is manifested in both economic and social infrastructures. In order to increase the efficiency of consumer cooperation enterprises, they are guided by marketing provisions, study the market situation, analyze the work of competitors, predict the dynamics of preferred demand and possible supply of goods and services, as well as the purchasing power of the population.

2 Materials and Methods

Scientific methods, works of domestic and foreign scientists researching problems of food security of the state, transformation of channels and logistics of food supply, creation of nutritional resources are used as methodological base of this work. The work used general scientific approaches to cognition, methods of synthesis and analysis, as well as comparative, abstract-logical and monographic methods. In assessing the modern activities of consumer societies, the formation of food resources revealed vectors of a promising direction using the advantages of cooperative norms and principles. The article uses the provisions of regulatory legal acts and targeted programs on food security, statistical materials on the activities of regional structures of the Central Union of Russia.

An active scientific discourse is being conducted on the topic under study in the works of Nabieva et al. (Nabieva et al. 2019; Nabieva and Tkach 2019), Tkach et al. (2019), Nechitailov et al. (2019), which define the theoretical basis of this research.

3 Results

The role and significance of consumer cooperation in the formation of food resources of the regions and Russia was revealed and argued, the peculiarities of the development of the production base in the consumer cooperation of the Central Union of the

Russian Federation were revealed. Recommendations on ways to improve the work of consumer societies in the creation of procurement and marketing cooperatives have been adjusted.

4 Discussion

Consumer cooperation has traditionally been engaged in entrepreneurship in the field of food supply. In modern conditions, the provision of food to the population under sanctions and embargoes occupies a significant place in economic processes, and interest in cooperative entrepreneurship in the food market has increased. In consumer cooperation, entrepreneurship can be considered as intra-cooperative, as well as include in joint activities a number of cooperative enterprises, individual links and individual entrepreneurs operating within the boundaries of consumer societies.

In economic literature, industrial entrepreneurship has become widespread, including material, intellectual, creative activities; commercial—includes sale of goods; The insurance guarantor shall indemnify against the cases stipulated in the contract. There is also an intermediary enterprise in which procurement offices and consumer cooperation points participate (Main indicators of the socio-economic activity of consumer cooperation of the Russian Federation for 2019).

Forms of entrepreneurship can be small, medium and large businesses. There are certain criteria for entrepreneurship to belong to a certain form: on the share in the authorized capital; the average number of workers in a calendar year; by revenue from the sale of goods. There are 4 types of entrepreneurial activity: production; commercial; financial and advisory.

In form, entrepreneurship is individual, collective and state. Entrepreneurship can be the sphere of activity of various organizational and legal forms of cooperatives, partnerships and joint-stock companies, including limited liability companies (Maksaev et al. 2019).

Entrepreneurship is a risky area of activity. The risk of the entrepreneur is determined by the uncertainty of achieving the result. At the same time, in the absence of entrepreneurship in society, it is impossible to expect effective economic development. Entrepreneurs accumulate and introduce innovative achievements in their work, which provides them with a breakthrough in increasing labor productivity and achieving high economic indicators. Effectively allocating and using resources, experienced entrepreneurs, thanks to their competence, receive an appropriate certificate and are allowed to advise others, proving their significance for the development of society (Morozova et al. 2019).

A number of European States have adopted regulations confirming the competence of entrepreneurs who are issued with a certificate giving the right to open their business. The activity of entrepreneurs is aimed at implementing innovative ideas, developing new products and creating highly efficient business models. In developed countries, entrepreneurship is recognized as one of the main drivers of economic recovery (Kaurova et al. 2020).

Entrepreneurs of the consumer cooperation system in their work use market mechanisms when using their own material, technical and financial resources in solving their tasks, in order to improve the quality of products and services. An important area of employment of entrepreneurs in consumer cooperation is the purchase of agricultural products. In 2019, cooperators of the Central Union bought 52.5 thousand tons of meat and meat products, 218.9 thousand tons of milk and dairy products, 162.7 million eggs, 33.5 thousand tons of potatoes, 40.7 thousand tons of vegetables, 24.5 thousand tons of fruits from households of the population.

Entrepreneurship in consumer cooperation has its own characteristics, which depend on the type of activity. Both individual entrepreneurs and cooperative enterprises with large labor collectives operate in the system. The largest area of activity of entrepreneurs in consumer cooperation is trade, which in 2019 amounted to 60.0%, purchases of agricultural products—11.9%, catering—6.9%, wholesale trade—4.42%, industrial products—10.0%, services—2.75%, other types—4.0%.

A number of citizens in the consumer cooperation system begin with small businesses, being individual entrepreneurs, offer separate services. With the strengthening of the material base and the presence of demand, production volumes also increase (Dudukalova et al. 2020).

The growth of entrepreneurship is influenced by economic inequality, the lack of individual goods and services, and the increased demand for them, which encourages the development of communication with partners to establish a sustainable operation of their enterprise. The development of cooperative ties in entrepreneurship directs partners to joint activities (Maksaev et al. 2020a).

At this stage, entrepreneurship in consumer co-operation faces some economic difficulties during the start-up period due to the lack of financial resources for the purchase of materials for sustainable activities. Entrepreneurs tend to be more likely to achieve the goal with the least cost in order to generate income and other benefits from the use of existing property, from the sale of goods produced, or from the performance of services. In consumer co-operation, an entrepreneur is an independent economic individual who wants to receive income. He is financially responsible for the results of his work, risks losses or ruin (Suglobov and Tkach 2020).

A wide field for entrepreneurship is the purchase of wild plants. The potential of natural resources in the country is not fully used, the necessary regulatory framework has not been developed, effective economic mechanisms in standardization and certification have not been established, this problem is not enough in the field of the national economy. While Russia's natural resources are large.

The improvement of the development of the wild products market was negatively affected by economic transformations in the recent history of the country. Rapid actions during the reform years significantly violated the existing traditional system of organizational and economic ties of rural harvesters of wild plants, harvesters and processors of forest products. Prior to the reforms, 18 thousand procurement points operated in the country, taking mushrooms, berries, and medicinal herbs from the population for money. During the period of mass reorganization, many procurement offices ceased their activities, collapsed and were liquidated. Currently, there are 25

times fewer in the country's consumer cooperation. On the domestic market, there is an annual increase in the supply of wild products by 10–20% (Maksaev et al. 2020b).

Procurement and production activities in the field of entrepreneurship development in the wild plants industry have significant potential in increasing the collection and production of food products from environmentally friendly wild mushrooms, berries, nuts and other crops. For the development of entrepreneurship, this area has good prospects, since the scale of Russia's natural resources provides an increase in the collection of mushrooms, berries, nuts and other natural products. In society, the demand for products of wild forest crops is increasing, which encourages rural residents to develop entrepreneurship in the sector of collecting and industrial processing of wild plants, improve methods and technology for collecting wild crops, and form and develop the business of wild plants. In this direction, entrepreneurs from a number of regions of the country work smoothly. In 2019, the consumer co-operation of the Central Union of the Russian Federation purchased fresh fruit-berry wild crops—420.5 tons, cranberries and lingonberries—183.8 tons, nuts—143.9 tons, a large number of mushrooms.

The activities of cooperative organizations in the field of procurement and processing of products from wild crops are one of the promising areas for the development of entrepreneurship. The introduction of cashless settlement for purchased wild products during the period of mass collection allows cooperative organizations not to take short-term loans.

For the production of food products in the system of the Central Union of Russia in 2019, 1269 workshops for the baking of bread and the production of bread products, 83 workshops for the production of sausage, 34 workshops for the production of canned food, 801 workshops for confectionery products, 680 workshops for the production of semi-finished products. In consumer unions and cooperatives in Russia, entrepreneurship is improving, becoming increasingly widespread and developing in the food supply system, in the formation of food reserves and resources to ensure national food security and independence.

5 Conclusion

The economic entrepreneurship of cooperators in consumer societies of the Central Union of Russia contributes to the growth of food security for residents of the regions. Cooperative entrepreneurship is of particular importance for rural areas. Entrepreneurs produce high-quality products, introduce innovations, create new jobs in the countryside, pay taxes, contributing to this increase in wealth. Cooperative entrepreneurship in rural areas is aimed at solving both social and economic problems, contributing to meeting the population's demand for goods and services, and improving the comfort of living in rural conditions. In order to achieve success, entrepreneurs are guided by the introduction of innovations, identify key problems, analyze them and solve issues in production activities, which eventually leads to success.

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Advanced Innovations in the Accounting and Analytical Support of Agricultural Production as the Basis for Sustainable Development of the Region's Food Subsystem

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Abstract The purpose of the research is to improve the accounting and analytical support of agricultural production by strengthening the control function of accounting, implemented through the application of digitalization innovations. Currently—the global economy with fierce competition and objective economic realities (inflation, foreign exchange rate growth, the cost of borrowed capital, monopolies of processors, overproduction of oilseeds and technical crops), the owners of economic entities representing the agricultural production of the region are searching for reserves to stabilize profits. The authors of this article analyzed the dynamics of the main indicators of the development of the food subsystem of the region and proposed options for increasing control over the expenditure of assets. Building an automated management accounting system allows you to detail accounting, increase its efficiency and affect the quality and timeliness of management decisions. Installation of GPS—navigators on motor vehicles and machine-tractor units; the use of automatic electronic weights that exclude the human factor in the grain storage warehouse; breadcrumbers with electronic weights; collars with chips for cows are tools for strengthening control and reducing the labor intensity of compiling accounting records when drawing up facts about the economic life of agricultural producers. The theoretical and practical significance of the results of this study is in the possibility of applying these approaches by agricultural producers to further reduce the cost of products and increase profits.

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JEL Code M 410

1 Introduction

Krasnodar Territory is characterized by a favorable climate, fertile soils, scientific potential, a significant share of the rural population, the presence of infrastructure and proximity to seaports. Therefore, these competitive advantages should become a catalyst for the construction of an export-oriented food economic subsystem. However, analyzing in dynamics the financial results of agricultural producers and a high share of borrowed capital (82% of revenue), it is necessary to note an insufficient level of profitability of agricultural production (27.7%) in comparison with other sectors of the economy, especially livestock production (17.7%).

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as Bzhasso (2014), Kartashov et al. (2018), Khodarinova (2017), Cozzani and Zanelli (2007), Gubinelli and Cozzani (2008), Jensen (2001), Jensen (1986), Stein et al. (2001), Frantsisko et al. (2020), Chernyavskaya et al. (2020).

2 Methodology

Climate change is seriously affecting the gross harvest in the crop industry from weather factors (lack of moisture in the fall of 2019-spring 2020), which increases risks. Low profitability in animal husbandry reduces investment attractiveness, which leads to a reduction in the stock of the main herd from 259 thousand goals. cows in 2010 up to 211 thousand goals in 2019, that is, by 18.5%. Except that ensuring food security (security and availability of food, quality of food, health of the nation, life expectancy) has to become a priority and also the locomotive for creation of export-oriented economy (the share of export of food in 2019 in the region made 34.17% of the total cost of export that on $369 thousand dollars. USA exceeds the level of 2017 or by 17.44%—Fig. 1). This will allow better use of agricultural land, increase employment of the population, develop rural areas, and increase budget revenues.

In order to achieve this strategic goal, it is necessary to take into account the experience of developing agricultural production in countries that are leaders in this industry, namely Argentina, Brazil, Israel, the USA and Canada. For example, the successful experience of the Republic of Argentina: the population of 38.6 million inhabitants (can feed 400 million people); The value of food exports is $24 billion, which is 55% of all exports. Argentina is a food supplier to China with a population of over 1 billion inhabitants. Thus, the authors of the article note the unconditional

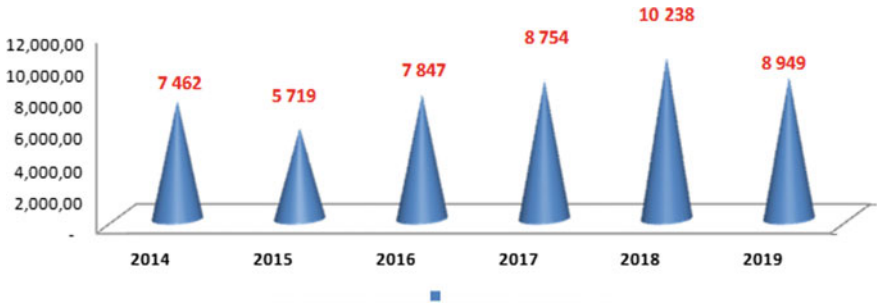

Fig. 1 Cereal export dynamics in the Krasnodar Territory, (thousands of tons). *Source* Statistical collection "Agriculture of the Krasnodar Territory 2019"

relevance of building an export-oriented food subsystem of the region with achieving high financial results of agricultural producers.

3 Results

The cost of production is a subjective factor and largely depends on the quality and timeliness of management decisions, which is especially significant in agriculture, which is characterized by seasonality and long capital turnover. To reduce the cost of products, we offer a number of proposals to build an automated management accounting with an increase in its control function.

Firstly, the use of GPS navigators on machine-tractor units allows daily "loading" information into 1C: "Accounting" in the document "Register of the tractor driver" on the duration of the unit, the number of hectares completed, exceeding the recommended speed of movement of each type of work, which affects the size of grain losses during harvesting or germination of seeds during sowing. This makes it possible to reduce the labor intensity of the tractor crew accountant, daily form accounting records and inform workers and industry specialists about the amount of accrued wages, excess of fuel consumption standards for each type of work, each machine and tractor unit, machine operator with details for each nomenclature group (culture) and field (structure of crop rotation), as well as compare the performed types of work taking into account agro-technical requirements with the approved technological map of crops cultivation.

Secondly, in dairy cattle breeding (beef cattle) to control feed consumption, we recommend the use of feed distributors with built-in weights and the ability to "automatically download" information in 1 C daily: "Accounting" on loaded feeds by number and type of nomenclature (combined feed, hay, feed additives, silage, senage), as well as by mixers (1 feeder—up to 5 tons), territorial location of animals (sections), sex age groups.

This will eliminate the write-off of feed that has not been loaded into the feed distributor. At the same time, the task of compiling the "Feed Plan" document (Figs. 2, 3, 4 and 5) is quite difficult, where it is necessary to correctly plan the laying of food in the feed distributor, taking into account the diet of feeding each age group, animal productivity, territorial location and feeding time (fractional feeding: morning, lunch and evening).

4 Conclusion

The algorithm for filling out the "Feed Plan" document takes place automatically on the basis of the data of the accounting registers of management accounting in addition to the data on account 01 "Fixed assets" in the part of cows of the main herd and account 11 "Animals on cultivation and fattening" in the part of young animals by quantity broken down by sex and age groups and fixed rationals (also from the document "Setting the diet" with periodization). During the "conduct" of the "Feed Plan" document, the compliance of both the total number of heads and the breakdown by sex and age groups and territorial location is checked (if discrepancies are identified, the correct loading by the name of the subdivision (for example, farm 2), the date of the document—in case of discrepancies, the document is not carried out).

After that, a document "Write-off of feed" is formed daily (Fig. 6) with the formation of accounting records for each type (nomenclature) of feed with detail for each age group, taking into account the territorial location of animals and their productivity. Also, when creating accounting records for each type of feed (nomenclature), in addition to the warehouse, the "Location" (bunker silo No. 1, Hay-filled mattress No. 2, etc.) is also indicated, which additionally allows you to strengthen the control of residues for each location of the feed. When conducting this document, it is checked for compliance with the type of food nomenclature in the write-off and in the diet (for example, combination food for highly productive cows was not indicated when feeding low-productive cows of the main herd).

Therefore, the authors of the article proposed algorithms for strengthening the control function of accounting by building an automated management accounting system and integrating innovative developments in the development of the food subsystem of the region.

Indicators	TERRITORIAL LOCATION											
	Truss No. 2/Building No. 5/Building 5/Section 1											
	Name of sex and age groups					Name of sex and age groups					TOTAL	
	Foraging cows/From 111 to 305 days of lactation					Foraging cows/1 to 30 days lactation (incl.)						
	Pukhno Maxim Alexandrovich			Mix Numbers		Pukhno Maxim Alexandrovich			Mix Numbers			
Number of heads	27			1,2,4,8		5			1,2,4,8		32	
Forage	Expenditure per 1 head per day			Consumption Total per day		Expenditure per 1 head per day			Consumption Total per day		Consumption Total per day	
	by diet	% increase of the fact to diet	fact (diet +%)	by diet	fact	by diet	% increase of the fact to diet	fact (diet +%)	by diet	fact	by diet	fact
Protein, vitamin and mineral supplements , Protein vitamin-mineral concentrates	3,90	20,00	4,68	105,30	126,36	3,90	20,00	4,68	19,50	23,40	124,80	149,76
Water	4,50	20,00	5,40	121,50	145,80	4,50	20,00	5,40	22,50	27,00	144,00	172,80
Granules	0,50	20,00	0,60	13,50	16,20	0,50	20,00	0,60	2,50	3,00	16,00	19,20
Lupin inactivated	8,42	20,00	10,10	227,34	272,81	8,42	20,00	10,10	42,10	50,52	269,44	323,33
Recipe for compound feed No. 1 (over 20)	4,21	20,00	5,05	113,67	136,40	4,21	20,00	5,05	21,05	25,26	134,72	161,66
Alfalfa senage	1,00	20,00	1,20	27,00	32,40	1,00	20,00	1,20	5,00	6,00	32,00	38,40
Hay vika + oats	24,77	20,00	29,72	668,79	802,55	24,77	20,00	29,72	123,85	148,62	792,64	951,17
Corn silage of milk-wax ripeness	2,06	20,00	2,47	55,62	66,74	2,06	20,00	2,47	10,30	12,36	65,92	79,10
Sunflower extraction cake	1,61	20,00	1,93	43,47	52,16	1,61	20,00	1,93	8,05	9,66	51,52	61,82

Fig. 2 Recommended document “Feed plan” sheet 1 “Feed sheet” block “Agriculture” in the program “1S: Accounting”. *Source* Compiled by the author

FORAGE	Unit	Actual flow rate (as mixer average) per day	
		per 1 head	fact
Mix № 1	**Heads**	**408,00**	
Protein, vitamin and mineral supplements , Protein vitamin-mineral concentrates	kg	1,14	464,72
Water	kg	1,30	531,36
Lupin inactivated	kg	0,15	59,58
Recipe for compound feed No. 1 (over 20)	kg	2,46	1,003,33
Alfalfa senage	kg	1,23	501,66
Hay vika + oats	kg	0,29	119,16
Corn silage of milk-wax ripeness	kg	7,23	2,951,59
Sunflower extraction cake	kg	0,60	245,48
Soybean extraction cake	kg	0,47	191,85
Mix № 2	**Heads**	**418,00**	
Fractional. | Farm No. 2/Building No. 5/Building 5/section1 | Foraging cows/From 111 to 305 days of lactation | Pukhno Maxim Alexandrovich			***27,00***
Fractional. | Farm No. 2/Building No. 5/Building 5/section1 | Foraging cows/From 111 to 305 days of lactation | Pukhno Maxim Alexandrovich			***28,00***
Fractional. | Farm No. 2/Building No. 5/Building 5/section1 | Foraging cows/From 111 to 305 days of lactation | Pukhno Maxim Alexandrovich			***11,00***
Protein, vitamin and mineral supplements , Protein vitamin-mineral concentrates	kg	1,13	471,98
Water	kg	1,31	545,66
Granules	kg	0,03	11,00
Lupin inactivated	kg	0,14	60,41
Recipe for compound feed No. 1 (over 20)	kg	2,42	1,009,71
Alfalfa senage	kg	1,22	511,78
Hay vika + oats	kg	0,30	124,11
Corn silage of milk-wax ripeness	kg	7,12	2,977,99
Sunflower extraction cake	kg	0,60	249,44
Soybean extraction cake	kg	0,47	196,25
		etc.	
	Total heads:	**825,00**	

Fig. 3 Recommended document "Fodder plan" sheet 2 "Breakdown by mixers" block "Agriculture" in the program "1S: Accounting". *Source* Compiled by the author

Indicators	TERRITORIAL LOCATION									
	Truss No. 2/Building No. 5/Building 5/section 1									
	Name of sex and age groups				Name of sex and age groups				Total	
	Foraging cows/From 111 to 305 days of lactation				Foraging cows/1 to 30 days lactation (incl.)					
	Pukhno Maxim Alexandrovich				Pukhno Maxim Alexandrovich					
Number of heads	27				5				32	
Forage	Expenditure per 1 head per day		Consumption Total per day		Expenditure per 1 head per day		Consumption Total per day		Consumption Total per day	
	by diet	% increase of the fact to diet	fact (diet +%)	by diet	fact	by diet	% increase of the fact to diet	fact (diet +%)	by diet	fact
Protein, vitamin and mineral supplements , Protein vitamin-mineral concentrates	3,90	4,55	105,30	22,75	3,90	4,55	19,50	22,75	124,80	149,76
Water	4,50	5,21	121,50	26,05	4,50	5,21	22,50	26,05	144,00	172,80
Granules	0,50	0,59	13,50	2,95	0,50	0,59	2,50	2,95	16,00	19,20
Lupin inactivated	8,42	9,80	227,34	49,00	8,42	9,80	42,10	49,00	269,44	323,33
Recipe for compound feed No. 1 (over 20)	4,21	4,91	113,67	24,55	4,21	4,91	21,05	24,55	134,72	161,66
Alfalfa senage	1,00	1,17	27,00	5,85	1,00	1,17	5,00	5,85	32,00	38,40
Hay vika + oats	24,77	28,81	668,79	144,05	24,77	28,81	123,85	144,05	792,64	951,17
Corn silage of milk-wax ripeness	2,06	2,40	55,62	12,00	2,06	2,40	10,30	12,00	65,92	79,10
Sunflower extraction cake	1,61	1,88	43,47	9,40	1,61	1,88	8,05	9,40	51,52	61,82

Fig. 4 Recommended document “Feed plan” sheet 3 “Comparison of diet and fact” block “Agriculture” in the program “1S: Accounting”. *Source* Compiled by the author

FORAGE	Unit.	Actual expenditure per day, total	Actual expenditure per day, total	Actual expenditure per day, total	Actual expenditure per day, total	Actual expenditure per day, total	Actual expenditure per day, total
		Mix № 1	**Mix № 2**	**Mix № 3**	**Mix № 4**	**and etc.**	**TOTAL**
Protein, vitamin and mineral supplements , Protein vitamin-mineral concentrates	kg	464,72	471,98		464,72		**2 031,08**
Water	kg	59,58	60,41		59,58		**245,63**
Granules	kg	1,003,33	1,009,71		1,003,33		**4 300,42**
Lupin inactivated	kg	501,66	511,78	140,25	501,66		**6 059,37**
Recipe for compound feed No. 1 (over 20)	kg	119,16	124,11	56,10	119,16		**1 504,35**
Alfalfa senage	kg	2,951,59	2,977,99	321,75	2 951,59		**14 305,93**
Hay vika + oats	kg	245,48	249,44	44,55	245,48		**1 371,95**

Fig. 5 Recommended document “Feed plan” sheet 4 “Total consumption fact” block “Agriculture” in the program “1S: Accounting”. *Source* Compiled by the author

N	Forage	Sender Location (Analytical Object # 2)	Unit	Expense per 1 head		Consumption of total per day		Number of Profeed	Accepted for write-off
	Nomenclature			Standard rate	Fact	Standard rate	Fact		
1	Hay vika + oats	Hay-filled mattress No. 1	kg					205,884	205,884
	Vika + oats 2020 (hay)			3,000	3,490	177,000	205,884		
2	Winter wheat straw	Stack No. 1	kg					179,765	179,765
	Winter wheat (straw)			4,000	3,047	236,000	179,765		
3	Corn silage of milk-wax ripeness	Bunker silo No. 1	kg					333,411	333,411
	Silos 2019			6,000	5,651	354,000	333,411		
4	Haylage senage	Pit No. 3	kg					193,594	193,594
	Haylage of 2019			12,000	3,281	708,000	193,594		
5	Sunflower extraction cake	Feed-preparation house	kg					135,208	135,208
	Sunflower non-granular extraction cake			0,700	2,292	41,300	135,208		
6	Recipe for compound feed No. 3 (for calves 7-18)	Feed-preparation house	kg					84,504	84,504
	p.3 Fodder recipe No. 3 (for heifers 7-18) MTF No. 2, No. 3 (02.10.20)			2,000	1,432	118,000	84,504		

Fig. 6 Recommended document “Feed write-off” block “Agriculture” in the program “1S: Accounting”. *Source* Compiled by the author

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Modern Approaches Towards Improvement of the Mechanism of State Regional Administration

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Abstract The modern socio-economic development of the Russian regions is characterized by active dynamic processes, deepening level differentiation and unbalanced regional development, unsatisfactory parameters of the quality of life of the population. Most constituent entities of the Russian Federation are characterized by a low level of economic development, as a result, acting as recipient regions, they maintain their economic potential mainly through inter-budget transfers and a system of budget financing. The specificity of the prevailing conditions for the development of regional economic systems is reflected in the negative trends in the dynamics of the level and quality of life of the population, the increase in its stratification, the deterioration of the social situation, which characterizes the instability of regional development and the low level of efficiency of regional management (Vasilyev et al. Int J Civ Eng Technol 9:124–138, 2018). The purpose of the research is to systematize the vision of the content and orientation of modern approaches to improving the mechanism of public regional administration in the context of its strategy, development of functionality and improvement of regional governance models. The methodology of the study is based on methods of theoretical synthesis and systematization, which allowed structuring the main provisions reflecting the modern vision of building a mechanism for effective regional state management of territorial development, ensuring the strengthening of the contribution of regional economic systems to the development of national economic potential (Lukysha Int J Adv Stud 5:36–44, 2015). As a result of the research, a strategic vision of the mechanism of State regional governance (Naryshkina et al. J Soc Polit Econ Stud 45:93–112, 2020), which is oriented towards ensuring the priorities for the development of the Territory, taking into account the regional characteristics of economic capacity-building, the conditions and factors of development and the measures implemented to create prerequisites for ensuring the sustainability of the regional economic system, has been determined.

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Keywords Public administration · Region · Regional governance mechanism

JEL Code R58

1 Introduction

Issues of regional development management and ensuring its sustainability are one of the priority research areas, the solution of which determines the success of structural transformations, the prospects for overcoming crisis processes, the possibility of a transition to sustainable development and the formation of Russia's competitive advantages in the global economic space. This requires new approaches to building regional economic development mechanisms as part of the national economic system (Battalova et al. 2019).

In the traditional sense, the mechanism of State regional governance is considered as an element of the system of public administration and, in a meaningful context, is a set of management entities, the forms, methods, tools used by them to carry out a targeted impact on the objects of State regional management and the implementation of managerial functions.

A modern view of the content and orientation of regional public administration in its strategic vision involves the construction of a mechanism that ensures the effective management of changes balanced with sustainable development of the Territory, which allows strengthening its competitive potential mainly on an innovative basis in the context of the globalization of economic processes. From a process point of view, regional management in the strategic framework involves the implementation of the functions of the management cycle as part of ensuring the socio-economic development of the Territory in a long-term projection.

The complexity of the problem is due to the need to build a regional public administration mechanism that would be able to quickly adapt to modern challenges, accumulate the necessary resources and potential for these purposes (Alexandrova et al. 2021), including through the active use of modern tools of strategic management, marketing, project activities and the advantages of digital transformation of the economy.

Many works of modern authors have been published on the problem under study, including the work of Horbliuk (2016).

2 Methodology

The results of the theoretical and methodological research made it possible to form a conceptual representation regarding the elementary composition of the mechanism of state regional management, its subjects and objects, the principles of the implementation of control influence and management functionality (Fig. 1). And if

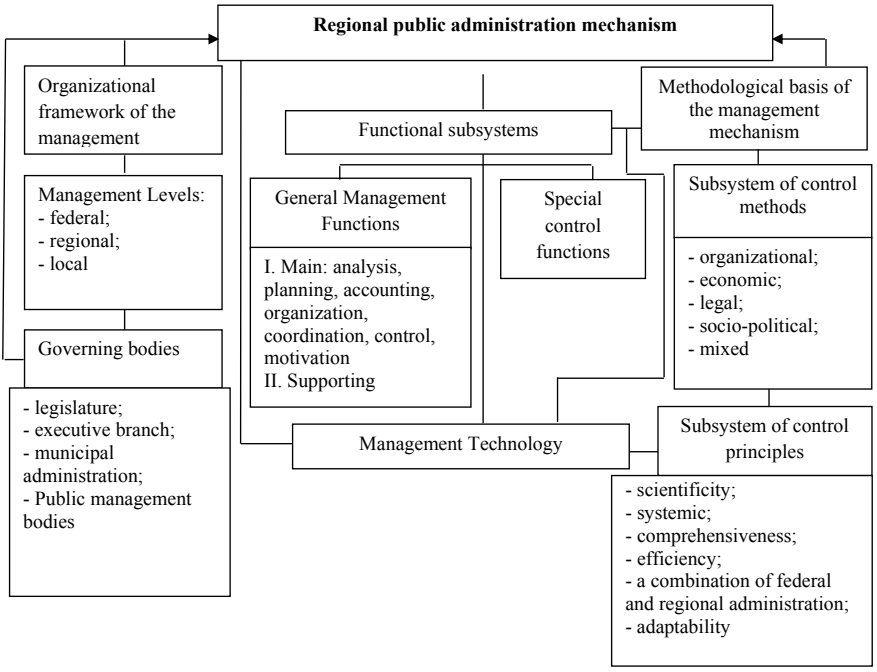

Fig. 1 Structure of the regional public administration mechanism. *Source* Compiled by the authors

these elements in the content are not modified, then the control technology and its instrumentation are transformed under the influence of various factors.

The need to implement strategic approaches in regional governance is defined at the legislative level and is based on its coordination mechanism at all levels of government in relation to budgetary policies and mechanisms of interaction with entities forming the external contour of strategic management (Prudskiy et al. 2017).

The qualitative content and target orientation of the regional government mechanism is changing, with a view to a consistent qualitative change in the regional socio-economic system, ensuring an increase in the level of well-being of the population as a result of achieving sustainable functioning and development due to the accumulation of competitive potential and a balanced economic development.

The strategy analytical tools, which is currently actively used in regional management practices, includes a set of policy and project documents on the basis of which the regional development planning system is built in the medium and long term. It must be stated that information factors are now becoming the driver of regional development.

The model of strategic management of the region was supplemented by another corporate management tool—program-targeted management, based on setting

strategic and tactical goals, criteria for their achievement, allowing us to create conditions for their achievement with the lowest costs as a result of the interaction of all stakeholders in regional development: the state, society and business.

It is the programmatic target management that can ensure the rational and effective use of the region's resource potential in accordance with its strategic development goals and priorities, and clearly articulate and subsequently achieve its results by engaging and taking into account the interests of all stakeholders.

3 Results

Program-oriented management, combined with project management in the regional strategic management system, makes it possible to radically change the approach to medium-term forecasting, linking it with long-term trends in the development of the regional system in the mode of coordinating the development, implementation of long-term strategies and development programs of the country as a whole, the region and individual sectors, and sectors of the economy in relation to goals, timelines and activities. In fact, a mechanism of "results management" is being advocated, ensuring the interconnection of the results of the activities of public authorities and the financial resources allocated for these purposes.

In order to improve the mechanism of regional strategic management based on increasing the efficiency of project activities, in our opinion, regional executive authorities should actively implement regional best practices.

The results of an empirical research of the mechanism of state regional administration on the example of the Nizhny Novgorod region make it clear that:

(1) problematic aspects of improvement of organizational structure of implementation of national projects in the region with debugging of mechanism of interaction of project offices at regional OAS with municipal project offices due to creation of specialized working groups in the context of national projects;
(2) the creation of institutional conditions for the implementation of the Strategy of socio-economic development of the region remains an important area of implementation of the functionality of regional management. The mechanism is consistent with the approved plan for the implementation of the Strategy, taking into account modern challenges, the vision of the population regarding the priorities for the development of the region. An Expert Council has been formed, holding strategic sessions on a regular basis, with consideration of approaches to assessing the effectiveness of the Strategy. As a result, the activities of the Strategy are linked to regional state programs, the authorities responsible for their implementation are identified. Work is underway on the formation of methodological recommendations for the development of a strategy for the socio-economic development of the municipality. A pilot municipality has been defined to test them. After finalization, the recommendations will be introduced into the practice of local governments, which will allow building

a unified system for achieving strategic priorities, ensuring coherence at the regional and municipal levels.

(3) the functionality of regional management covers program planning and monitoring of the implementation of state programs in the region. In 2019, 93.5% of the regional budget expenditures were carried out within the framework of state programs of the region.

(4) the organization of program-targeted and project management does not differ in the originality of mechanisms and the focus on results that have a prolonged effect.

We consider it advisable to build a regional model of project management, which provides for the integration of business into the mechanism of project practice (Fig. 2).

Three types of management entities are identified in the model:

(1) permanent management bodies of the project activity:

- The Project Coordination Council will ensure business integration into project management at all stages of implementation (Ye et al. 2019);
- The regional project office—traditionally for all regions—is a specialized executive body coordinating the economic development of the territory;
- departmental coordination body;
- departmental project office—structures formed on the basis of executive authorities participating in project activities;

2. temporary management bodies of the project activity (individual in each specific case of the project implementation);

3. auxiliary management bodies of the project activity:

- Public Business Council;
- Expert group;
- Project management competence center.

It must be stated that in fact the entire design management loop in terms of project development and implementation is shifting to the regional level of management. However, this category of projects has a number of specific features that influence the nature and direction of the governance mechanism, including:

1. The individuality of specific measurable objectives for each project, which can often lead to conflicts of interest between the objectives of one project and the objectives of another project; therefore, there is a need to align them with the strategic priorities of the country and the region.
   The key goal that defines the strategic management of regional development is to ensure a consistent and constant increase in the quality of life of the population of the region. It is objectively derived from ensuring the sustainability and balance of the development of the region's economy, expressed in increasing its competitiveness in the scale of the national economy and global economic processes. The goal can be achieved by ensuring the effective use

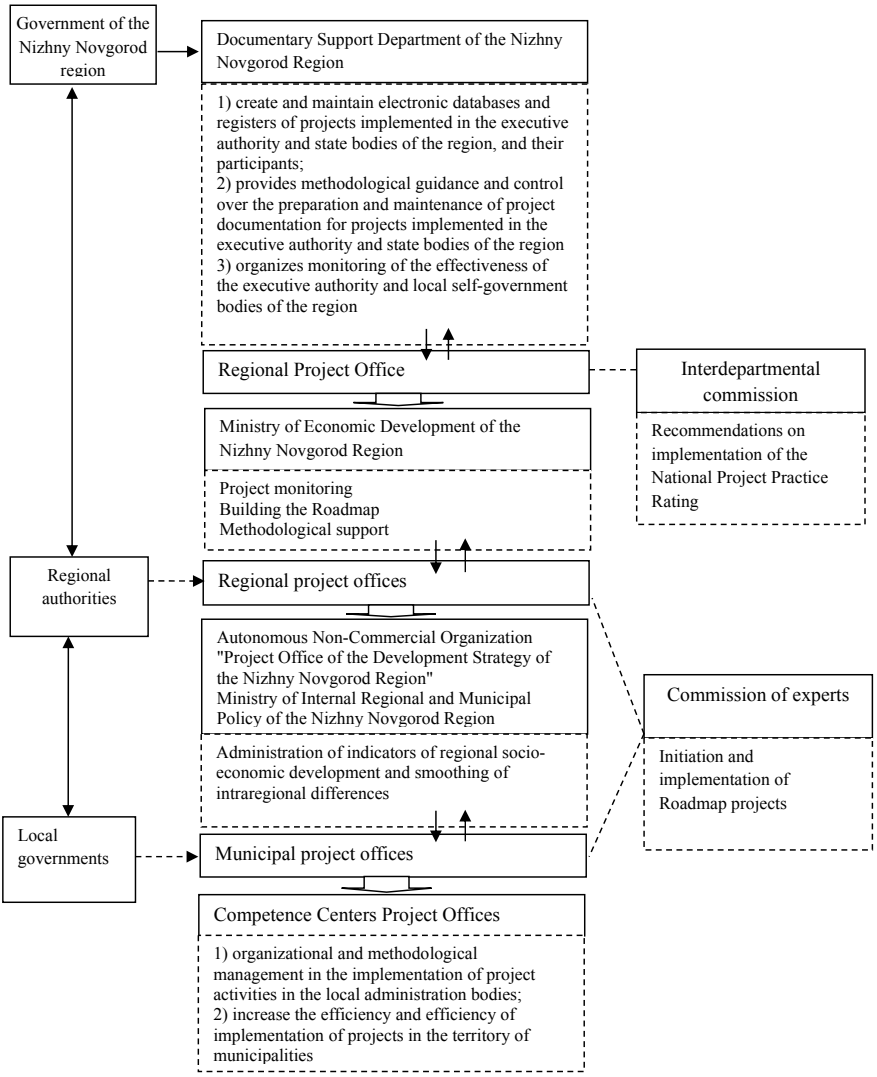

Fig. 2 Recommended model of project management of the Nizhny Novgorod region, focused on integrating business into the mechanism of project practice. *Source* Compiled by the authors

of regional potential, the continuous development of infrastructure conditions that increase the business activity of economic entities, including by creating a favorable investment environment, reducing administrative barriers, building a constructive dialogue between government and business, and, finally, structural regionalization, which creates prerequisites for the subsequent diversification of the regional economy, the emergence of new promising industries.

2. Concentration of management impact and budget financing on measures ensuring maximum contribution to the achievement of key priorities of public policy implementation in relevant sectors and sectors (Bolumole et al. 2015). Strategic regional management targets in this framework should focus on achieving a balanced regional budget that promotes financial self-sufficiency and budgetary sustainability in the implementation of strategic goals and objectives. This strategic objective is achieved by strengthening tax capacity and improving tax administration in the region, achieving effective public debt management, implementing a regional budget policy that ensures the balance of local budgets and concentrating financial resources on priority areas of regional development (Yi et al. 2018).
3. Tightly link funding processes to management processes in all phases of project activities.

With the integration of various approaches into the improvement of the regional strategic management system, it is obvious that the upper management loop presented by the strategies for the socio-economic development of the region, the set of development targets and state programs is the subject area of program-targeted management. The project management loop captures state programs, the project activities of regional executive authorities and local self-government, resources and processes that ensure project management. Process management as a subject area covers the processes of operational activities of state authorities of the constituent entity of the Russian Federation and local authorities and the resource potential of the region.

4 Conclusions/Recommendations

The areas of improvement presented cover various areas of strategic regional management, which should be considered exclusively as integrated management solutions that contribute to improved governance at the regional level. But the priorities of strategic management will be achieved with the appropriate development of the functionality of state regional management.

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Organization of Activities of District Courts in the Regional Management System

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Abstract The article examines some aspects of the organization of the activities of district courts as the main link of courts of general jurisdiction, as well as topical issues of the organization and effectiveness of the judiciary of the Russian Federation as a whole, which have an impact on the formation of the conditions for the operation of district courts. The activities of district courts are regulated by the relevant legislation. At the same time, problems and negative phenomena manifested in the practical activities of judicial authorities, including district courts, need scientific analysis and synthesis, clarification of their causes and factors, and the results of scientific research are recommended to be used in improving legislation, as well as to form methodological support for the activities of district courts. In this regard, the article summarizes the opinions and proposals of practicing judges to improve the organization of the activities of district courts and the preference for solving certain practical issues, such as ensuring an even workload of judges, choosing criteria for evaluating the activities of the district court, creating conditions for the effective work of district court judges and others. The article considers various approaches to the definition of the concept of judicial power, identifies the principles of the judiciary, groups of factors of the effectiveness of the judicial system, the main problems of the judicial system, causing debate and increased attention from citizens, business representatives and practicing judges. The organizational characteristics of the district court regulated by the legislation and the functions of the district courts are disclosed. On the data of reporting on the activities of district courts of the Chuvash Republic, a system of indicators is given, for which reporting of district courts is formed. Their dynamics over two years, presented in tabular form, are also considered. Conclusions are drawn on the need for scientific and methodological support

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for the activities of district courts, the development of scientifically based norms and standards for the workload of courts and individual judges, the improvement of criteria for assessing the effectiveness of courts, and the application of rational approaches to the distribution of cases among judges of the district court.

Keywords Judicial power · Workload of judges · Judicial system · District courts · Factors of effective judicial system

JEL Code K1

1 Introduction

Judicial power is exercised through the activities of the courts. Courts of general jurisdiction include district courts, the effectiveness of which depends on the legislative, regulatory and organizational and methodological support for their activities. The study of the problems and conditions of the district courts is of scientific and practical importance for improving the judicial system.

2 Materials and Methods

The research was conducted using both secondary and primary sources. The current legislative and regulatory acts defining the requirements for the formation and operation of district courts, as well as their place in the judicial system of Russia, have been studied. As primary sources, the reports of the district courts of the Chuvash Republic and the consolidated report on the activities of the judicial system of the Chuvash Republic for 2017–2018 were used. The data obtained by the authors in the process of their professional activities were also used.

3 Results

The Constitution of the Russian Federation treats legislative, executive and judicial powers as independent branches of government (Constitution of the Russian Federation: with amendments submitted to the All-Russian 2020). In the scientific literature, the concept of judicial power is used by authors in several meanings. When describing the structure of power, the judiciary is considered as a state activity to resolve legal conflicts (between people, organizations, person and organization, person and state bodies). The next interpretation is the activities of the judiciary in the implementation of powers. The institutional approach to judicial power is to identify it with the totality of all types and levels of the judiciary.

As an integral part of the institution of state power, the judiciary is a condition for the formation of the rule of law, ensuring the protection of the rights and freedoms of members of civil society on the basis of a balance of interests of the individual, society and the state. Under the influence of various factors, the judicial system is periodically reformed. The main changes in the judicial system include the unification of the Supreme Arbitration Court of the Russian Federation and the Supreme Court of the Russian Federation (2014), the creation in the system of courts of general jurisdiction of appeal and cassation courts (Federal constitutional law 2018), the abolition of a number of courts of the district (city) level based on quantitative criteria of burden on judges (so-called small courts).

Judicial power is exercised through the judicial system. Improving the efficiency of the judicial system is a priority of scientific research and discussion, attention from citizens, business representatives, and practicing judges. At the same time, such problems as the level of protection of the institution of private property, the objectivity and fairness of court decisions, the problem of training and professional development of judges, and the high burden on judges are discussed. The question of reducing citizens' confidence in the judicial system as a whole is often raised, which is directly related to the need to prevent corruption and corruption schemes.

The effectiveness of the judicial system depends on a variety of factors, which in turn are interrelated and give rise to positive or negative effects (Table 1).

The judiciary has a unique role in the machinery of State power, since it is, on the one hand, a subject defining the boundaries of the activities of the legislative and executive powers, and, on the other hand, has certain limits of activities. The monitoring activities of the judiciary are carried out both within the judicial system (internal control) and in relation to the legislative and executive branches.

The boundaries of the judiciary are defined by general legal principles and the functioning of the judiciary.

District courts organize activities in accordance with the principles of the unity of the judicial system, the binding of court decisions, the inviolability of judges and others.

There are several links of civil courts of general jurisdiction (Fig. 1).

District courts consider civil, administrative, criminal cases in the first instance and in the appellate instance in relation to justices of the peace, that is, they are

Table 1 Factors of the effective judicial system of the Russian Federation

Factor groups	Form of manifestation, indicators
Legal	Quality of legal regulation of legal proceedings and procedural relations
Personnel	Professional and personal qualities of judges, persons in the judicial system
Organizational	Organization of the activities of the judiciary, their equipment. Quality of judicial administration
Economic	Principles and organization of financing of the judiciary (its bodies)
Effectiveness	Ensuring and implementing judicial principles, the rule of law and justice

Source Compiled by the authors

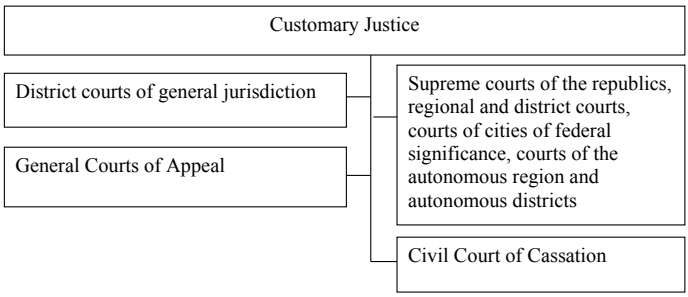

Fig. 1 Composition of courts of general jurisdiction. *Source* On the judicial system of the Russian Federation: Federal Constitutional Law No. 1-FKZ of December 31, 1996 (On the judicial system of the Russian Federation 1996)

directly a higher court in relation to justices of the peace (Law and of 07.02.2011 No. 1-FKZ 2018).

The powers of judges of district courts (On the status of judges in the Russian Federation 1992) in the course of conducting cases are regulated by the Code of Criminal Procedure of the Russian Federation (Code of Criminal Procedure of the Russian Federation: Code of Criminal Procedure: text with amendments and supplement 2001), the Code of Civil Procedure of the Russian Federation (Code of Civil Procedure of the Russian Federation: GPC2002), as well as the Code of Administrative Offenses of the Russian Federation (Code of the Russian Federation on Administrative Offenses 2001), other regulatory acts, including the Code of Administrative Procedure.

We will consider on the materials of the district courts of one of the constituent entities of the Russian Federation some results of their activities in the consideration of various categories of court cases.

Fines occupy the highest proportion of used penalties for administrative violations (66.8% in 2017. and 58.8% in 2018). The administrative arrest is also often used in such cases, the share of this punishment increased to 33.5% in 2018 compared to 24.8% in 2017. Table 2 shows the most commonly used types of administrative punishment, in fact, all types provided for by law are used, that is, prevention, disqualification, deprivation of special right and others.

The analysis of Table 3 showed that the district courts of the Chuvash Republic consider various categories of civil cases, the largest proportion is occupied by cases arising from housing relations (8.3%), then cases on family legal relations (4.6%) and cases related to land ownership and land use.

The data of Table 4 indicate that more than a third of the criminal cases considered by the district courts of the Chuvash Republic in 2017 and 2018 relate to article 158, 158.1 of the Criminal Code of the Russian Federation (on theft and petty theft). Cases of robbery (article 161 of the Criminal Code of the Russian Federation) and cases of illegal actions with narcotic drugs occupy approximately the same proportion. The number of criminal cases of intentional infliction of grievous or moderate bodily harm in 2018 decreased slightly, but still occupies 6.6–6.7% in the total number of

Table 2 Main penalties for administrative offences adopted by the district courts of the Chuvash Republic

Type of administrative punishment	2017		2018	
	Number of people	Total proportion %	Number of people	Total proportion %
Penalty	5,046	66.8	2,860	58.8
Administrative arrest	1,877	24.8	1,630	33.5
Mandatory work	353	4.7	72	1.4
Administrative expulsion from the Russian Federation of a foreign citizen or stateless person (additional punishment)	298	3.9	240	4.9

Source Alexandrova et al. (2021)

Table 3 Civil cases considered by the district courts of the Chuvash Republic in 2018

Category of civil cases	Total Cases	Total proportion %
Family disputes	1,573	4.6
Labour disputes	772	2.3
Housing disputes	2,806	8.3
Real estate disputes (land, land use)	1,690	5.0
Other litigation cases	13,856	40.9

Source Alexandrova et al. (2021)

criminal cases considered. The number of cases of violations of traffic safety rules decreased by 26 units, the specific gravity—from 5.9 to 5.2%. The number of fraud cases remains high (204 cases in 2017 and 197 cases, and 2018), which account for more than 6.5% of the total number of criminal cases.

In general, the participation of district courts in the consideration of criminal, civil and administrative cases by the courts of the Chuvash Republic is presented in Table 5.

The most discussed problem in the activities of the district courts is the issue of the workload of the district courts and the timing of the consideration of cases. At the same time, there is a difference of approaches to the assessment of these indicators in the scientific literature and in the reports of judicial departments (Alexandrova et al. 2021).

In scientific articles, there are more often statements about the need to reduce the burden in order to create conditions for a more detailed study of cases, it is proposed to introduce the specialization of individual judges in the conduct of the same type of cases. The reports of the heads of the judicial departments assess as negative the

Table 4 Criminal cases examined by the district courts of the Chuvash Republic in 2017–2018

Types of crime	2017		2018	
	Number of people	Total proportion %	Number of people	Total proportion %
Theft, petty stealing	968	31.3	1,017	33.7
Robberies	268	8.7	229	7.6
Illicit drug-related activities	233	7.5	220	7.3
Wilful health damage	208	6.7	200	6.6
Fraud	204	6.6	197	6.5
Violation of traffic safety rules	183	5.9	157	5.2
Crimes against the authorities	126	4.1	115	3.8
Murders	74	2.4	54	0.2

Source Alexandrova et al. (2021)

Table 5 Number of cases considered in the Chuvash Republic by courts of various levels in 2017–2018

Case Category	Considered					
	Supreme Court		District Court		Magistrates	
	2017	2018	2017	2018	2017	2018
Criminal	10	12	3,083	3,047	3,731	4,058
Civil	90	39	51,627	28,295	95,906	121,858
Administrative	655	377	8,712	5,909	59,502	69,612

Source Alexandrova et al. (2021)

increase in the number of cases that are considered above one and a half months. For example, in the district courts of the Chuvash Republic, the number of such cases increased in 2019 to 308 compared to 280 cases in 2018, while the burden on the consideration of criminal cases increased from 1.9 cases per month in 2018 to 2.6 cases per month in 2019.

Practicing judges propose changing approaches to the distribution of civil cases among judges. Basically, these proposals are aimed at improving the effectiveness of the administration of justice by optimizing the workload of district court judges and creating conditions for improving the qualifications of judges through the consideration of homogeneous cases. Some proposals are well founded and detailed. For example, in the distribution of civil cases, it is proposed that all disputes and materials

in the case be transferred to the judge who made the first procedural decision on it. Secondly, it is proposed to distribute cases taking into account their connection with each other, since this reduces the labor intensity of consideration of cases in terms of cost optimization of studying the legislation and circumstances of the case, and also simplifies the organization of the process (notifications to the same addresses, persons, etc.). In practice, there are situations that adversely affect the availability of justice and the timeline for resolving cases. As an example, a statement of claim was repeatedly returned by different judges on different grounds at the initiation stage. The actual reason was a large number of plaintiffs (about 30) and defendants (15 organizations), that is, a complex dispute had to be considered (Ershov et al. 2017).

Moreover, in the distribution of related cases to different judges, the trial will depend on the desire of the judges to wait for the decision of colleagues, which leads to a delay in the consideration of cases, on the merits.

Practicing judges believe that the consideration of homogeneous cases not only reduces labour intensity, but also creates conditions for better consideration of many episodic cases with common characteristics. It is proposed that the current automatic (application-based software) distribution of cases should be adjusted by the President of the Court on the basis of the approaches considered.

An even distribution of the workload among judges is a prerequisite for improving the effectiveness of the administration of justice. To this end, it is proposed to assess the workload of the judge by the number of cases completed, as well as by the number of cases or materials transferred to the judge over a certain period of time on the basis of the accrual account (the number of cases from the beginning of the year, the number of cases from the beginning of the month, etc.).

4 Conclusion

The development of science-based norms and standards is an urgent issue for the judicial system of the Russian Federation. In scientific terms, it is also necessary to conduct a study of the criteria for assessing the activities of district courts. Researchers consider it controversial to use the indicator of the proportion of confirmed sentences of district courts on appeal to evaluate the activities of the district court. For example, the change in this indicator from 91.5% in 2017 to 90.5% in 2018 and a further decrease to 86.3% in 2019 on the sentences of the district courts of the Chuvash Republic, in our opinion, cannot be considered as a negative trend, since a more detailed assessment of the factors of the current dynamics is required.

The development of the judicial system, the improvement of the activities of district courts, as the main link of courts of general jurisdiction, requires scientific and methodological support in modern conditions.

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On Improving the Model of Forecasting Innovative Regional Development

Shamil I. Nigmatullin

Abstract Forecasting and evaluation are an essential stage of innovative regional development since they lay the foundation for government programs and regional objectives and goals. Forecasting is especially important when environmental factors negatively impact innovative regional development. Therefore, the creation of forecasting models for innovative development is a universal tool for the sustainable and dynamic development of the country's regions. In this study, I will analyze the theoretical and methodological foundations of forecasting the diffusion of innovation. Diffusion of innovation theory is based on the methods of mathematical modeling proposed by E. M. Rogers and F. M. Bass. In my own method for forecasting innovative regional development, innovation is compared to an epidemic that spreads between two consumer groups: innovators and imitators. Building upon the F. M. Bass theory, I substantiated the need to use the diffusion of innovation theory for forecasting the indices of innovative regional development. Moreover, I proposed the mathematical formula for calculating the moment where an innovation transitions from the state of growth to the state of saturation. Additionally, I developed an algorithm for evaluating the adequacy of forecasts. All these mathematical tools were tested on the example of the Republic of Bashkortostan, according to the data of the state program for innovative regional development. The reported study was funded by RFBR, project number 19-310-90037/19.

Keywords Region · Innovation · Innovation processes · Innovation development · Forecasting · Diffusion of innovation model · Imitators · Innovators · F.M. bass model

JEL Codes C53 · O21 · O32

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1 Introduction

The current COVID-19 pandemic has impacted most socio-economic processes in all countries and regions. In such conditions, researching the patterns and specific features of innovative regional development is especially important since forecasting these processes would contribute to economic sustainability and resilience on the regional, national, and even global level.

Several studies by foreign (Bass 1969; Nabseth and Ray 1974; Rogers 2003) and Russian scholars (Tukkel and Tsvetkova 2015) dwell on forecasting the development of socio-economic and innovative processes. Some scholarly works (Gaynanov et al. 2015, 2017) focus on the models for forecasting indices of socio-economic systems at regional and national levels.

A literature review of the aforementioned works allowed me to propose an improved method for forecasting innovative regional development. This method compares innovative processes to epidemic ones—an innovator carries the "disease" of an innovative novelty and "infects" the imitators with it, turning them into new "carriers" of innovation.

2 Materials and Methods

Previous studies confirmed that the distribution of innovation is similar to physical diffusion. Physical diffusion is the net movement of something from a region of higher concentration to a region of lower concentration. In socio-economic systems, this "something" is an innovation.

Nosonov, a Russian scholar, believes that the distribution of innovation takes two forms (Nosonov 2015):

1. Processes in manufacturing and sales;
2. Processes in the consumer market.

The first one is connected to the propagation of manufacturing novelties, while the second one—with the new goods that result from these novelties.

Regional innovative development mainly concerns itself with the first type. However, they are severely under-researched, compared to the second type, which can be explained by the following:

1. The distribution of new goods is more expansive;
2. The statistical data for quantitative research is more easily obtained;
3. The recurrence of obtaining statistical data can be higher, which supplies a larger quantity of data.

Moreover, scholarly literature lacks methods and approaches to quantitative evaluation of the distribution of innovations in manufacturing and sales. However, there

are numerous official indices for the real qualitative level of technological and innovative development of regions. These two facts increase the relevancy of researching the use of diffusion models for innovative regional development.

According to the diffusion of innovation theory, best described in the works of Rogers (2003), there are several categories of consumers for a novelty: innovators, early adopters, early majority, late majority, and laggards.

Innovators are the first to adopt innovations. They are well informed, financially secure, and generally young people of high social status.

Early adopters are progressive people that understand the positive impact of innovations and their necessity as an attribute of status.

Early majority includes people that understand the value of innovation and want to use them before most people.

People from the late majority mainly want to obtain innovations to fit in or due to its outstanding economic advantages.

Laggards are the most conservative or the least economically secure people. More often than not, laggards are older people.

The graphical interpretation of E. M. Rogers's theory is presented by Curve 1 in Fig. 1.

According to the subsequent studies of Baranovsky (Baranovsky and Puzyrevskaya 2018) and Tarde (1903), E. Rogers used an S-curve of social processes to describe the process of quantitative consumption of an innovation. The formula for the curve takes the following form:

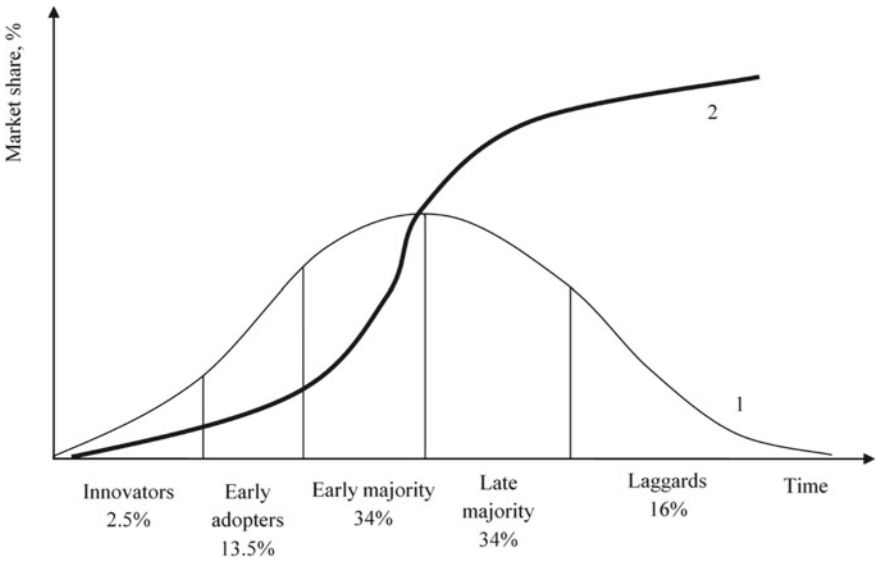

Fig. 1 Graphical interpretation of diffusion of innovation. *Note* 1—curve line of the consumers of innovation; 2—curve line of the spread of innovations on the market. *Source* Compiled by the authors based on the work of Rogers (2003)

$$N_t - N_{t-1} = kN_{t-1}(M - N_{t-1}) \tag{1}$$

where:

N_t and N_{t-1} is the amount of consumers that received the innovation at the moments t and $t - 1$, respectively;

M is maximum amount of consumers;

$(M - N_{t-1})$ is the amount of future consumers at the moment t.

(Formula 1 is presented as Curve 2 in Fig. 1.)

A specific feature of all S-curves is three areas: slow growth, sudden growth, and saturation. The limits of these areas are especially noteworthy. The transition from slow growth to sudden growth corresponds to the beginning of the extreme demand for innovation. The transition from sudden growth to saturation corresponds to a lower demand for innovation. Figure 1 shows that the slow growth area includes innovators and early adopters, sudden growth—to the early majority, and saturation—later majority and laggards.

Establishing the curve for the distribution of innovation allows to establish the current stage of the process and to forecast its prospects. For this reason, the mathematical model of the diffusion of innovation is especially important.

Bass (1969) made a significant contribution to the theory of E. M. Rogers. He developed a mathematical model for the distribution of innovation. This model is regarded as practically sound and accurate. The F. M. Bass model can be described by the following statements:

1. There are only two consumer categories: innovators and imitators. The former are progressive people, ready to consume an innovation based on its description, not the reviews of other people. The latter prefer to gather as much information as possible (including reviews of the innovators) before consuming an innovation. These people, for the most part, care about the public opinion on innovation, not its characteristics and specifications;
2. There is a linear dependence between the people who consume the innovation and the chance of its adoption by more people;
3. In the beginning, the adoption of innovation is mainly driven by innovators. Further, due to the spread of relevant information, imitators drive innovation.

The third statement allowed me to establish that the F. M. Bass model is based on an epidemic approach to modeling the distribution of innovation. This approach presents diffusion of innovation as viral distribution: direct contact between innovators and imitators helps propagate innovation. Imitators "infect" imitators with innovation, turning them into additional "carriers."

The formula for the F. M. Bass model of diffusion of innovation looks like this:

$$\frac{dF}{dt} = p + (q - p)F - qF^2 \tag{2}$$

where:

F is the number of innovation consumers, measured in fractions of units;

p and q are relative indices that describe the share of innovators and imitators in the total number of consumers.

Index p is called a coefficient of innovation or of external influence; index q is called a coefficient of imitation or of internal influence.

According to the studies of Kantor (Kantor 2015; Kantor et al. 2020), Formula 2 is solved in the following way:

$$F = \frac{C + \frac{p}{q} e^{-(p+q)\cdot t}}{C - e^{-(p+q)\cdot t}} \tag{3}$$

where:

$C = \frac{F_0 + \frac{p}{q}}{F_0 - 1}$; F_0 is the starting number of consumers of innovation.

F. M. Bass confirmed that the distribution of innovation will always follow Formula (2), regardless of the starting point in time. Such universal nature and easy interpretation of results makes F. M. Bass model quite useful for analyzing and forecasting innovative regional development.

Several practical studies with the use of F. M. Bass model (e.g., one by D. Chandrasekaran (Chandrasekaran and Tellis 2007) established several patterns:

- The average variation of innovation coefficient lies between 0.0007 and 0.03, and between 0.38 and 0.53 for imitation coefficient;
- The average value of the innovation coefficient is 0.001 for developed countries and 0.0003 for developing countries;
- The average value of the imitation coefficient is 0.51 for developed countries and 0.56 for developing countries.

These values can be used in similar studies as indicators and references—for example, in forecasting innovative regional development.

3 Results

Indices of innovative regional development in Russia are developed by regional executive authorities. The indices serve as short-term and medium-term references and objectives. Increasing trust in these indices requires better methods for substantiation. For this reason, this study poses several tasks:

1. Develop a procedure for calculating indices of the F. M. Bass model (2) in the innovative regional development in manufacturing and sales, accounting for official forecasts;
2. Test this procedure on the example of the Republic of Bashkortostan.

To calculate p and q indices, I will use the non-statistical method of O. G. Kantor (Kantor 2015). This method does not require a large amount of data, which is especially beneficial because regions usually have serious gaps in their statistical bookkeeping of innovation indicators.

Building upon Solution (3), the model for calculating p and q indices would look like this:

$$\varepsilon \to \min_{p,q}$$

$$\left|F_t^{\text{actual}} - F_t^{\text{calc.}}\right| \le \varepsilon, t = \overline{1,m}. \tag{4}$$

$$p \ge 0,001.$$
$$q \ge 0.$$

where:

F_t^{actual} index of innovative development during t period, according to official statistics;
$F_t^{\text{calc.}}$ index of innovative development during t period, according to Solution (3);
M overall amount of actual data.

The point in the S-curve where sudden growth transitions to saturation, with a second derived function that equals 0, is calculated according to the following:

$$F' = \frac{-\frac{p}{q}(p+q)e^{-(p+q)\cdot t}\left(C - e^{-(p+q)\cdot t}\right) - (p+q)e^{-(p+q)t}\left(C + \frac{p}{q}e^{-(p+q)t}\right)}{\left(C - e^{-(p+q)t}\right)^2}$$

$$= \frac{-(p+q)e^{-(p+q)\cdot t}\left(\frac{p}{q}C - \frac{p}{q}e^{-(p+q)\cdot t} + C + \frac{p}{q}e^{-(p+q)\cdot t}\right)}{\left(C - e^{-(p+q)t}\right)^2}$$

$$= \frac{-\frac{p}{q}(p+q)\left(\frac{p}{q}+1\right)Ce^{-(p+q)\cdot t}}{\left(C - e^{-(p+q)\cdot t}\right)^2}$$

$$F'' = -\frac{p}{q}(p+q)\left(\frac{p}{q}+1\right)$$

$$C\frac{-(p+q)e^{-(p+q)t}\left(C - e^{-(p+q)t}\right)^2 - 2\left(C - e^{-(p+q)t}\right)(p+q)e^{-2(p+q)t}}{\left(C - e^{-(p+q)t}\right)^4}$$

$$= \frac{p}{q}(p+q)^2\left(\frac{p}{q}+1\right)C\frac{e^{-(p+q)t}\left(C - e^{-(p+q)t}\right) + 2e^{-2(p+q)t}}{\left(C - e^{-(p+q)t}\right)^3} =$$

$$= \frac{p}{q}(p+q)^2\left(\frac{p}{q}+1\right)C\frac{e^{-(p+q)t}\left(C + e^{-(p+q)t}\right)}{\left(C - e^{-(p+q)\cdot t}\right)^3}$$

Therefore: $F'' = 0 \Rightarrow C + e^{-(p+q)\cdot t} = 0$.
Therefore, coordinates t^* of transition between sudden growth and saturation:

$$\begin{aligned} & e^{-(p+q)\cdot t} == -C \\ & -(p+q)\cdot t = ln(-C) \Rightarrow \\ & t^* = \tfrac{ln(-C)}{-(p+q)}. \end{aligned} \tag{5}$$

F. M. Bass model is a monotonic increasing function since it is an S-curve. Therefore, the initial data of this function must meet this requirement.

Building upon all mentioned above, I created the *procedure for assessing the accuracy of forecasted indices of innovative regional development*:

Stage 1. Determine the time series for this index, accounting for forecasted values (if any);

Stage 2. Find the range of non-decreasing values in the time series, including the current moment (if there is none, the diffusion of innovation is inapplicable);

Stage 3. According to data from Stage 2, solve the Problem (5) and plot the F. M. Bass model;

Stage 4. Assess the accuracy of the model via average approximation error:

$$\overline{A} = \frac{1}{m}\sum_{t=1}^{m}\left|\frac{F_t^{\text{actual}} - F_t^{\text{calc.}}}{F_t^{\text{actual}}}\right| \cdot 100\%.$$

If $\overline{A}$ is less than 10%, the model's accuracy is acceptable.

Stage 5. Calculate q/p;

Stage 6. Calculate t^* according to Formula (6).

Stage 7. Analyze all calculated indices and interpret results (including via graphs).

I tested this procedure on the indicators "Share of innovative goods in off-loaded goods, %" and "Share of companies that implement technological innovations, %" that are included in the programs for the development of the Republic of Bashkortostan. The initial data for forecasting is presented in Table 1.

The results of the calculations done in Stages 2–6 are presented in Table 2.

Low value of error of approximation ($\overline{A}$) points to the high accuracy of the model (Fig. 2). The conclusions on the modeling of the first index are as follows:

Table 1 Sampled indices of innovative development in the Republic of Bashkortostan

Index	2014	2017	2018	2019	2020	2021	2022
Share of innovative goods in off-loaded goods, %	20.4	21.5	23.6	23.8	24	24	24.2
Share of companies that implement technological innovations, %	-	22	25	29	33.2	37.4	41.5

Source Compiled by the authors based on (Republic of Bashkortostan 2016)

Table 2 Indices of F. M. Bass model for the innovative development of the Republic of Bashkortostan

Index	p	q	F. M. Bass model	$\overline{A}$	q/p	t^*
Share of innovative goods in off-loaded goods, %	0.007	0.001	$F = \frac{-9.4+7.3e^{-0.008t}}{-9.4-e^{-0.008t}}$	2.08	0.13	–
Share of companies that implement technological innovations, %	0.001	0.181	$F = \frac{-0.3+0.006e^{-0.182t}}{-0.3-e^{-0.182t}}$	0.57	180.56	6.83

Notes *absent value of t^* denotes a negative value that resulted from calculations in Formula (6)
Source Compiled by the authors based on (Republic of Bashkortostan 2016)

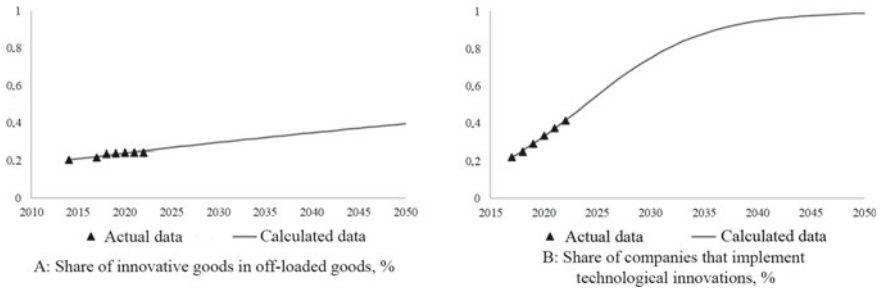

Fig. 2 Graphical interpretation of the F. M. Bass diffusion of innovations. *Source* Compiled by the author

- Internal influence coefficient is (q) very low; therefore, the q/p ratio is low as well. This indicates an extremely low number of imitator enterprises that are ready to adopt innovations;
- The medium-term and long-term growth dynamics of innovative production are "weak but positive" (Fig. 2A).
- The conclusions on the second index are as follows:
- Internal influence coefficient (q) and the q/p ratio demonstrate that the share of imitator enterprise is relatively high;
- The amount of enterprises that implement innovations tends to rise (Fig. 2B); the value of t^* shows that in the six-seven years the growth rates will continue to increase.

Overall, the results of models for *two indices* indicate that the *forecasts* for 2019–2022 (presented in the national program of Bashkortostan development) *contradict each other*—according to the second index, the number of enterprises that implement innovation will suddenly grow in the next six-seven years; however, the share of innovative goods in overall production will stagnate.

4 Discussion

Most scholars, for example Popkova (2012) or Leybert (Leybert and Vanchukhina 2013), focus on the need to forecast and plan the rate of innovation distribution among the consumer groups. Doing this would allow to correctly select the way of innovative regional and national development, accounting for unfavorable macroeconomic factors.

The study by L. I. Vanchukhina (Vanchukhina et al. 2018) confirmed that forecasting the number of high-performance vacancies and human capital should be the foundation for the innovative development of the regional economy since these factors promote the creation and distribution of innovations.

5 Conclusion

In this study, I proposed an improved model for forecasting regional innovative development processes. In contrast with existing models, this one is based on the non-statistical approach of diffusion of innovation and backed up by experimental evaluation of dependence between sustainability and receptiveness to the innovation of two consumer groups: innovators and imitators. Forecasting innovative regional development should be done by establishing a quantitative dependence between the demand for innovations among these two groups.

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Problems of the Formation of Subcentres in the Peripheral Territories of the Krasnodar City Agglomeration

Tatiana T. Avdeeva and Tatiana G. Lavrova

Abstract The purpose of the research is to assess the possibilities for the development of sub-centers within the Krasnodar city agglomeration, taking into account their spatial specialization in the production of goods and services, participation in the creation of jobs and improving the quality of life of the population of the peripheral territories of the agglomeration. The methodology of the research is based on the idea that urban agglomeration is an independent spatial unit with a large urban center and its surrounding periphery, connected by numerous industrial, economic, social, labor, transport, recreational links that provide a positive socio-economic effect in the development of nearby territories. The research is based on the results of the primary analysis of trends in the development of internal agglomeration processes within the borders of the Krasnodar city agglomeration. In the context of the spontaneous processes of agglomeration formation, centripetal tendencies are intensified, relationships based on labor migration from periphery to core prevail. At the same time, the opposite trend is noticeable—active population growth in the peripheral rural territories of the agglomeration; identify potential subcenters. Factors that both contribute to and hinder their development have been identified. The key issues of agglomeration development are the need to choose an interregional agglomeration management model as a holistic system; development of a general development strategy based on a study of the internal relationships of agglomeration participants changing the nature of relations between the core and rural areas, development of mechanisms for supporting the emerging local centers of rural–urban life.

Keywords Urban agglomeration · Rural territories · Rural–urban relationships · Sub-centers of agglomeration · Agglomeration development

JEL Codes R01 · R10 · O18 · O29 · R12 · R23 · R28

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1 Introduction

Each region is characterized by its own specificity and peculiarities of agglomeration processes. Among the existing developments on the management of agglomeration development, the main focus is on the study of the problems of the interaction of the agglomeration core with the periphery. At the same time, research on the interaction of peripheral territories with the agglomeration core is extremely limited. This problem is especially relevant for the rural periphery.

Currently, the interaction of the urban center with peripheral rural territories is accompanied by an aggravation of a number of problems: in the face of a shortage of land resources, the village becomes the place of presence of city enterprises; urban business does not fit into the structure of the local economy; environmental problems are worsening; ugly urbanization is developing, when large construction companies impose a policy of large apartment buildings on rural territories; large retail chains displace local business, which is accompanied by the closure of small enterprises. Due to the complexity of administrative inter-municipal regulation, a number of social problems arise.

The integration of rural areas into urban agglomerations and the search for opportunities to establish adequate mechanisms for managing their development as a whole is an urgent problem.

2 Materials and Method

The study of the problems of the development of urban agglomerations is currently devoted to the works of many scholars of regionalists. A number of authors note the completeness of the processes of extensive development of urban agglomerations, the determination of their quantitative composition and the transition to intensification of ties within already formed urban agglomerations, the tightening of the population into them and, as a result, an increase in the class of development. At the same time, there is a need to rethink the usual dichotomy of the urban population-rural population. According to the main sociocultural characteristics, the mixed rural–urban population of urban agglomerations is rightfully considered as a special—third category, along with the non-agglomerative rural and urban populations.

An approach is also valid, considering the category of urban agglomeration as an independent “urban unit” in contrast to the interpretation of agglomeration as a mechanical set of municipalities, whose interests in practice are often ignored and replaced by direct government (Shvetsov 2018a). All this causes discussions on issues of urban agglomeration development and dictates the need to study issues of formation of institutions for regulation of inter-municipal interaction (Puzanov and Lifanova 2018; Shugrina 2018).

The conducted literary review showed that the problem under study is presented in the works of Lappo et al. (Lappo et al. 2020), O’Sullivan (2002), Shvetsov (2018b).

The authors also used the materials from Strategy for the socio-economic development of the Krasnodar Territory until 2030 (Strategy for the socio-economic development of the Krasnodar Territory until 2030) in this article.

3 Results

1. Peculiarities of formation of Krasnodar agglomeration from the point of view of composition of participants and nature of relationships between agglomeration nucleus of rural periphery are considered. Within the administrative borders of Krasnodar (the core of the agglomeration) there are 29 rural settlements that form the first belt of rural territories. The second belt is formed by seven municipalities: three urban districts and four municipal districts, three of which are part of another subject of the federation—the Republic of Adygea.

The total area of the Krasnodar agglomeration is 726.4 thousand hectares, 9.68% of the entire territory of the Krasnodar Territory, the total population is 1473.3 thousand Persons (25.4% of the population of the Krasnodar Territory); population density—195 people per square km (in the region—74 people. per square km). The Krasnodar agglomeration can be attributed to the average population, it is comparable to the Kazan and Ufa agglomerations (1.6 and 1.4 million people, respectively), but less than the Yekaterinburg and Novosibirsk agglomerations (2.6 and 2.1 million, respectively).

The Krasnodar agglomeration in terms of population is the fastest growing in Russia, ahead of the growth rate of the population of the million-plus city. Population growth is mainly due to the nucleus. For example, in 2019–2020, the population growth rate in Moscow was 0.49%; St. Petersburg—0.26%, Kazan—0.43%, Rostov-on-Don—0.41%, while in Krasnodar—0.69%. In 2019, Krasnodar became the sixteenth million-plus city in Russia, the population was 1,014,996 people (in 2018—990,823 people) (Cities are millions of people in Russia 2020, 2019 2020).

2. Krasnodar agglomeration belongs to the monocentric type. In the context of the spontaneous processes of agglomeration formation, centripetal trends increase. The characteristics of the main relationships of peripheral municipalities with the agglomeration core are presented in Table 1.

Evidence shows that relationships based on labour migration from periphery to core prevail. At the same time, the balance of pendulum labor migration increases by an average of 0.3% per year (Table 2).

With the creation of new jobs in the city and an increase in the average monthly wage, higher growth rates of pendulum migration of the population are possible. All this indicates the continuation of centripetal trends in the development of the agglomeration.

At the same time, against the background of the general population growth of the agglomeration and the development of the core, the opposite trend is noticeable—active population growth also in the peripheral rural areas of the agglomeration.

For the period 2010–2019. the population of Krasnodar increased by 21.9%., Dinsky district—by 14.7%, Goryachy Klyuch—by 12.0%, Takhtamukaysky district

Table 1 Main relationships of municipalities forming the Krasnodar city agglomeration

Municipal unit	Area km^2	Population, people. 2019	Transport accessibility to Krasnodar, km	Summary of other criteria
Krasnodar—agglomeration core	841.4	1,014,996		The townspeople have houses in the rural territory closest to the city, where citizens place business in rural areas
Goryachiy Kluch	1755.6	68,842	60 km	Transit flows; pendulum migration, "second houses" of residents of Krasnodar, rest, treatment
Dinskoy district	1352.0	145,889	30 km; federal highway "Don"; two regional roadways; three railway lines	Transit flows, pendulum labor migration work to the city-center, trips for shopping and entertainment services; acquisition of real estate in the area by citizens; accommodation of enterprises of the city in the area, recreation in nature. Large agro-industrial complex enterprises are located

(continued)

Table 1 (continued)

Municipal unit	Area km^2	Population, people. 2019	Transport accessibility to Krasnodar, km	Summary of other criteria
Severskiy district	2122.0	123,219	30 km of the federal highway Pavlovsk-Novorossiysk; railway line Krasnodar-Novorossiysk	Transit flows; pendulum labor migration region-city; acquisition of real estate in the area by citizens; location of city enterprises in the area, tourism, recreation. A large industrial cluster is located. Large housing construction
Adigeisk	12,57	15,153	15 km federal highway; railway line	Transit flows; labour migration to Krasnodar; location of industrial enterprises
Takhtamukaiskiy district	463.6	85,905	Directly borders with the city of Krasnodar, two railway lines; highways	Transit flows, labor pendulum migration "district-city," receiving social services in the city, the district—the second trading platform of Krasnodar, active residential development, the purchase of housing by citizens in the region

(continued)

Table 1 (continued)

Municipal unit	Area km^2	Population, people. 2019	Transport accessibility to Krasnodar, km	Summary of other criteria
Teuchezhskiy district	698.0	20,563	10 km highway route M4-Don; highway Krasnodar-Maykop	Transit flows, labor pendulum migration, receipt of social services in Krasnodar (education), active development of agro-industrial enterprises

Source Lavrova (2018)(Lavrova 2015)

Table 2 Dynamics of pendulum labour migration, Krasnodar, thousand people

Indicator	2016 г	2017 г	2018 г
Balance of pendulum labour migration	35.81	36.08	36.29
Balance of pendulum migration by student population	9.85	9.86	9.86

Source Compiled by the authors based on(The number and migration of naseleniyakrasnodarsky edge in 2018)

Table 3 Dynamics of population change of Krasnodar agglomeration, people

Name of the municipality	2010 г			2019 г		
	Total population	Including city population	Including rural population	Total population	Including city population	Including rural population
Krasnodar	832,532	744,995	87,537	1,014,996	925,387	86,609
Goryachiy Kluch	57,289	30,126	27,163	68,842	39,636	29,206
Dinskaya district	126,871	–	126,871	145,889	–	145,889
Seversky district	112,942	51,376	61,566	123,219	57,140	66,079
Adygeysk	14,659	12,237	2422	15,153	12,728	2425
Takhtamukai district	69,662	44,061	25,601	82,905	55,300	30,605
Teuchezhsky district	20,563	5403	15,240	20,543	5584	14,979

Source Compiled by the authors based on (Official website of the Office of the Federal Service of the State Statistics Service for the Krasnodar Territory and the Republic of Adygea 2020)

Table 4 Volume of investments in the Krasnodar agglomeration, in 2018 (compiled by the authors)

Municipal unit	Total investments in agglomeration, carried out at the expense of the budget of the Municipal District and organizations, thousand rubles	Investments in fixed assets carried out at the expense of the budget of the Municipal District, thousand rubles	Share of total investments from the budget (%)	Investments in fixed assets carried out by organizations, thousand rubles	Share of total investments by organizations (%)
Krasnodar	128,623,054	741,938	68.0	127,881,116	77.4
Goryachiy Kluch	3,355,199	119,391	10.9	3,235,808	2.0
Dinskaya district	3,701,224	123,675	11.3	3,577,549	2.2
Severskiy district	26,247,610	55,364	5.1	26,192,246	15.9
Adygeysk	58,137	1149	0.1	56,988	0.03
Takhtamukai district	3,663,200	47,101	4.3	3,616,099	2.2
Teuchezhsky district	560,986	2819	0.3	558,167	0.3
Total	166,209,410	1,091,437	100	165,117,973	100

Source Main indicators of the socio-economic situation of municipalities (Main indicators of the socio-economic situation of municipalities 2020)

by 11.9%, in Seversky district and Adygeisk—by 8.3% and 3.4%, respectively. A decrease in the number was noted in the Teuchezhsky district—by 1.0%.

3. Based on the change in population dynamics and resettlement, potential subcenters of the Krasnodar agglomeration are determined: Dinskaya, Takhtamukaysky districts and the city of Goryachy Klyuch, Dinskaya and Takhtamukai districts, most closely located to Krasnodar. Additional factors for their growth are well-developed transport connectivity with the city. The increased attractiveness of these areas for the population is also explained by the active movement of business in them and the creation of jobs: in the Dinsky district—in the industrial sector, in Takhtamukai—in trade, logistics. The Dinsky district is characterized by an influx of external migrants, for Takhtamukaysky—an influx of residents from Krasnodar.

4. The growth of housing construction in the agglomeration core is also accompanied by its spread to the periphery (Fig. 1).

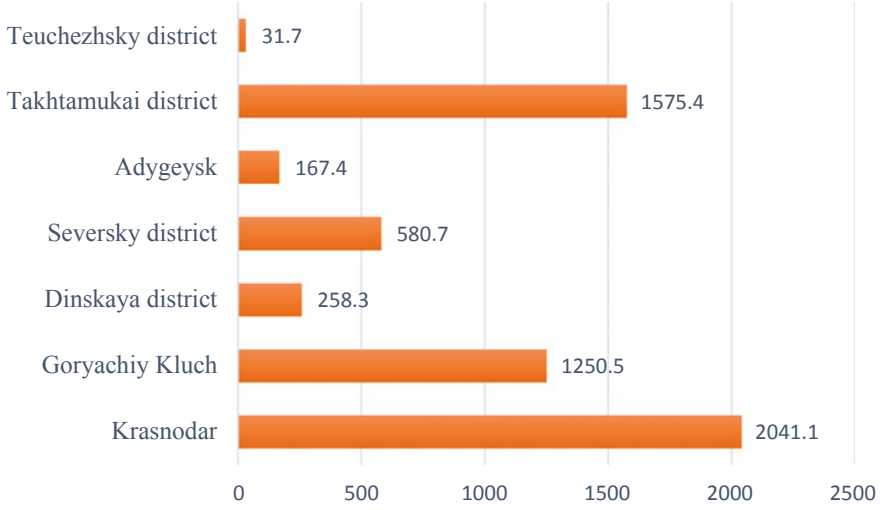

Fig. 1 Commissioning of residential buildings in the territory of the municipality, for 1000 people in 2018, m^2. *Source* Main indicators of the socio-economic situation of municipalities (Official website of the Office of the Federal Service of the State Statistics Service for the Krasnodar Territory and the Republic of Adygea2020)

The Krasnodar agglomeration forms the largest housing market in the region: in 2018, 2343.7 thousand m^2 of housing were collectively introduced into the agglomeration, which is 49.1% of the total housing commissioning in the region (4772.8 thousand m^2). Krasnodar is the leader in the volume of housing put into operation, falling on 1000 inhabitants—2041.1 m^2, the second place is taken by Takhtamukaysiy district—1575.4 m^2, where citizens buy houses and apartments cheaper than the city of Krasnodar. The third place is occupied by the city of Goryachny Klyuch, it develops as a recreational center of agglomeration, an environmentally friendly territory, has hourly transport accessibility to the center of agglomeration. Residents of Krasnodar and the region acquire "second houses" here.

5. A serious obstacle to the development of subcentres is the difference in jobs and wages, in the availability of many services. So, the average monthly accrued salary in 2018 amounted to 46,168, rubles in Krasnodar, while, for example, in Goryachiy Kluch—36,002 rubles. A relatively high average monthly salary is observed in the Seversky and Takhtamukai districts—41,187 rubles. and 35,210 rubles. respectively, and in the Teuchezhsky district—much lower—28,576 rubles. The lowest average monthly salary is noted in the city of Adygeisk—26,121 rubles. (Fig. 2).

6. Currently, while maintaining the existing spatial structure of the economy, imbalances between the center and the periphery of the agglomeration are growing: insufficient education, medical services for families living in the border

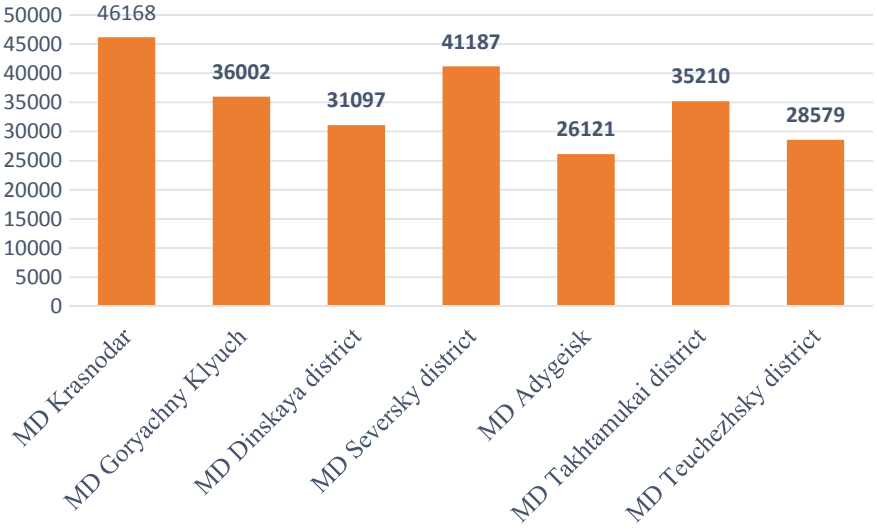

Fig. 2 Wage differentiation of agglomeration territories, RUB. *Source* Main indicators of the socio-economic situation of municipalities (Official website of the Office of the Federal Service of the State Statistics Service for the Krasnodar Territory and the Republic of Adygea2020)

territories (placement of children in schools, Danish gardens, ambulance problems, etc.); uncontrolled spread of the city—the core and multi-storey development of peripheral territories and, as a result, their transformation into multi-storey ghettos; difficulties in moving passengers by public transport inside the agglomeration, etc. (Filippov et al. 2020, p 77).

7. The main factor in the development of agglomeration is transport connectivity, which, as a rule, determines the degree of influence of other factors. Thanks to the development of transport, conditions can be created for the division of enterprises to the periphery, where the price of land is lower. Lower wages can also be an attractive factor for business in the suburbs. A high degree of motorization of the population contributes to the movement of labor with special competencies to the suburbs. At the same time, the construction of ring roads will facilitate communication with peripheral territories (Filippov et al. 2020, p 86).

   These circumstances explain the reasons for maintaining centripetal trends in the movement of labor migration of the population from peripheral zones to the center—the core of the agglomeration.
8. Factors contributing to development of opposite centrifugal tendencies and influencing formation of local sub-centres in peripheral zones of agglomeration are identified. They are associated with the specialization of territories in the production of goods and services. So, the industrially oriented territories include the city of Adygeisk (manufacturing, chemical industry, food processing) and

the Severskiy district (almost a quarter of the employed population is concentrated in industry—24.1%). On the other hand, the industrial area of the Severskiy district covers several settlements—urban-type settlements where oil and gas enterprises are located. Dinskaya district is characterized by agro-industrial specialization—mainly the processing of agricultural products. Both areas have good prospects related to non-agricultural activities (tourism, sports, recreation). They are also attractive to citizens: the purchase of a cottage, house, estate is a widespread phenomenon. Territories with agricultural specialization include the Teuchezhsky district. Trade and logistics prevail in the Takhtamukai region. Hot Key is positioned as a balneological and rehabilitation resort.

9. An assessment of the situation in the field of investment activities within the boundaries of the agglomeration is given. More than three quarters of the total investment falls on the core of the agglomeration—the city of Krasnodar—77.4%. Among rural municipalities, the Severskiy municipal district stands out, where 15.9% of total investments are concentrated, a significant part of which is carried out in the Severskiy oil refinery. 2.2% of total investments in agglomeration are invested in Takhtamukai and Dinskaya districts (Table 5). According to this indicator, the Takhtamukaysky and Dinskaya districts are ahead of the urban districts Goryachiy Kluch, Adygeisk, as well as the Teuchezhsky municipal districts.

At the same time, the Dinskaya and Takhtamukai districts are the territories of the presence of large industrial enterprises and retail chains in the city of Krasnodar. The total volume of investments in fixed assets carried out on the territory of the agglomeration amounted to 166,209,410 thousand rubles in 2018. The main share of investments is carried out at the expense of organizations located in the territory of municipalities—165,117,973 thousand rubles. (99.3%); the share of budget investments is insignificant and is only 0.7%.

In terms of investment in fixed assets per capita, “the first place is occupied by the Severskiy district—217, 67 thousand rubles, Krasnodar owns the second place—141.47 thousand rubles. then follow Dinskaya and Takhtamukaysky districts—50.83 thousand rubles. and 44.18 thousand rubles. Accordingly, the weakest in terms of investments is the city of Adygeisk (Fig. 3).

The main area of investment in the agglomeration was and remains housing construction. The possibility of acquiring housing on the periphery of the agglomeration is an important factor contributing to the movement of the population from the center, but not the only one. Other reasons can also be the movement of jobs following the movement of enterprises, as well as the reduction of costs for pendulum migration, due to improved transport accessibility. The interconnection of these conditions will lead to an extension of the range of industrial activity to the periphery.

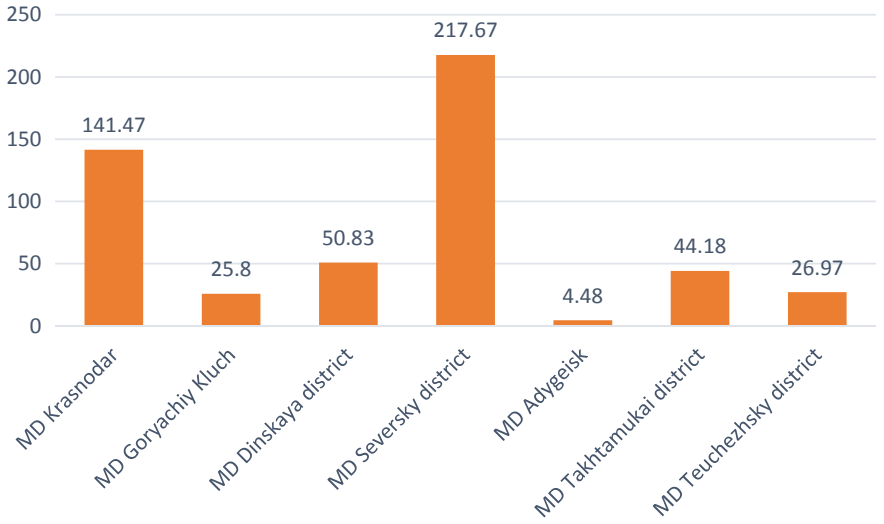

Fig. 3 Volume of investments in fixed assets per capita in 2018, thousand rubles. *Source* Main indicators of the socio-economic situation of municipalities (Official website of the Office of the Federal Service of the State Statistics Service for the Krasnodar Territory and the Republic of Adygea 2020)

4 Conclusion

10. The key problems of agglomeration development are institutional problems. First of all, we are talking about the need to choose a model for managing the development of agglomeration on the basis of inter-municipal cooperation on the principles of partnership and cross-sectoral cooperation (Avdeeva and Skripil 2018). These include the management of joint life support facilities, namely land use in adjacent territories, the maintenance and development of transport systems, engineering communications, social and communal infrastructure, as well as urban planning. Currently, there is no mechanism for coordination and interaction between municipalities included in the agglomeration. The problem of interaction between the municipalities of Adygea and Krasnodar Territory as representatives of different subjects causes particular difficulty (Filippov et al. 2020, p 81).

The current practice of developing strategic plans in municipalities rather indicates a desire to move away from solving the common problems of agglomeration relationships. Many representatives of administrations fear the loss of their independence if a common government is created. At the same time, the analysis shows that there are a number of favorable prerequisites for the movement of business and population to peripheral territories and the development of sub-centers specializing in the production of a complex of goods and services that create employment and reduce migration to the center of agglomeration.

The development of sub-centers as part of the agglomeration will be successful subject to inter-municipal cooperation, primarily in the field of urban planning. While large construction companies are imposing their commercial projects of apartment building on rural territories. Houses do not fit into the natural rural landscape, as a rule, they are not provided with social, transport, engineering infrastructure. In the absence of their own urban planning and housing policy of individual residential development, newly developed environmentally friendly areas of the village turn into impersonal urban blocks of a serial type.

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Innovative Cluster as a Structuring Element of Sustainable Spatial Development in the Region

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Abstract The purpose of this research is to study the sustainable development of the region and propose a model for the effective functioning of an innovative cluster that meets modern technologies and economic conditions. The research used empirical, theoretical, general biological methods of scientific knowledge, which allow identifying and substantiating the directions of sustainable development of territories. The work proposes a methodological approach, which consists in the development of organizational and methodological tools for the functioning of the innovation cluster in the context of ensuring sustainable regional development. The feasibility of forming an innovative cluster is due to the fact that it serves as a vector of growth in economic, production and social indicators of the efficiency of the region. The cluster within the region's economy creates infrastructure links that enable the generation, dissemination and application of new technologies and innovations. The authors highlighted the criterion features of the innovative cluster: the presence of modern infrastructure; the use of digital and information and communication technologies; specialization in innovative developments and their introduction into production; Large data and information flows using the latest digital platforms and software products a certain structure of participants. The use of an innovative cluster provides opportunities that contribute to sustainable regional development: ensuring the investment attractiveness of the region, increasing cash flows to the regional economy, increasing gross regional product, increasing business activity of production and financial structures, increasing tax revenues to the budget of the territorial unit, increasing exports of knowledge-based products, developing the regional industrial complex and related industries. The creation of innovative clusters contributes to the sustainable development of the territories within which they operate. The

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implementation of the cluster activities allows to significantly increase economic, production and investment indicators, while significantly reducing the costs of organizations for the production of products. Such a multiplier effect is achieved not only by the enterprises participating in the cluster, but also by the region as a whole.

Keywords Innovation · Innovation cluster · Regional system · Region development · Commercialization of knowledge · Transfer of innovation

JEL Codes D51 · O14 · O18 · O32 · O33 · P43 · R11 · R12 · R13

1 Introduction

The sustainable development of regions depends to a large extent on the effectiveness of the use of modern directions and approaches to the spatial organization of the territorial economy. Currently, the relationship between the participants in the development and creation of an innovative product is either not established at all, or has too weak a development. The reason is the weak integration of research and development organizations into the territorial economic system, as well as the lack of an instrument for the implementation of investment projects that are aimed at meeting the demand for innovative products and, as a result, the economic and production indicators of the region are declining. Increasing the degree of interaction between participants in the process of creating and producing an innovative product is the key to the effective implementation of the investment project. In this regard, the formation and functioning of innovative clusters is the most promising form of improving the spatial economic development of the territorial economy.

Innovative clusters have great potential and contribute to stimulating the advanced development of innovative industries and spheres of activity, increasing investment attractiveness, improving the state of regional infrastructure, implementing the integration effect, increasing the stability of territories under adverse internal and external factors.

Among the effective forms of spatial organization of production of knowledge-based products and digital technologies, an innovative cluster is a leader in the diffusion and acceleration of innovations—technical, technological, infrastructure, etc. The cluster, to a greater extent than individual market entities, is able to effectively innovate into the economy. In this regard, the topic of the research is particularly relevant.

The purpose of the research is to justify the effectiveness of the use of innovative clusters to increase the sustainability of the spatial development of the territory's economy.

The novelty of the study is as follows:

(1) the effectiveness of the formation of an innovative cluster as an element of the internal environment of the economic system of the region, the functioning of which contributes to its sustainable spatial development by increasing

the competitiveness and investment attractiveness of the territory due to the interaction of economic, integration and scientific subsystems;

(2) a model of functioning of an innovative regional cluster is proposed, the application of which will ensure the most efficient and integrated use of the economic, technological and scientific potential of the territory.

2 Materials and Method

Issues of theory and methodology for the development of cluster theory, the functioning of clusters, the formation of cluster policy were considered in the works of Russian and foreign scientists and practitioners: Porter (1988), Babkin et al. (2019), Kuzmina et al. (2020), etc. Innovations and innovative technologies have been investigated Gawer and Cusumano (2014), Cooke et al. (1998) etc. The conceptual issues of sustainable development of regions and improving regional competitiveness in Russia are devoted to works Morozova and Kabanov (2011), Burkaltseva et al. (2017), Shevchenko et al. (2020). Sectoral aspects of structural crises of regional development were studied Freeman and Perez (1988), Sukharev (2019), etc.

The recent unfavourable situation in the production and financial sector of the country, as well as the decrease in socio-economic indicators of the performance of most regions, dictates the need to form innovative clusters, which will directly affect the increase in sustainable development of territories. However, the analysis of the works of modern domestic and foreign scientists showed that a number of scientific aspects in the field of the formation and effective functioning of the innovation cluster have not been studied much. The relationship of the innovation cluster as an element of the economic system of regional development is not presented, the regularities of the impact of the cluster on the effectiveness of the territorial unit are practically not investigated.

We can conclude that there is a situation of lagging behind theoretical studies from practical ones. Thus, in modern science, there is not enough research on the study of the impact of the effective activities of innovative clusters on sustainable regional development, which predetermined the significance of the study.

The research used theoretical, empirical, general biological methods of scientific knowledge, which made it possible to identify and substantiate the impact of the effective functioning of the innovation cluster on sustainable regional development.

3 Results

Rationale for the formation of an innovative cluster as an effective tool of a regional economic system, the functioning of which will ensure the sustainable spatial development of the territory.

The sustainability of regional economic systems depends to a large extent on the impact of modern and efficient forms and technologies of territorial development, which contribute to maximizing the use of potential and counteract the negative influence of internal and external factors. The spatial development of the region, the reproduction and modernization of its infrastructure, production and innovation systems is determined by the efficiency and degree of use of the potential of these complexes. The potential of territorial development, representing the concentration of productive, innovative and institutional resources of the regional economic system, is reflected in the objectivity of their transformations in the investment, financial and organizational aspects. The management of territorial development and the effective use of innovative regional capacities are therefore of particular importance. One of the modern and effective tools that can ensure the sustainability of the territorial system is an innovative cluster.

Figure 1 shows the impact of the innovative regional cluster on the sustainable development of the region.

The cluster, as an element of the regional economic system, ensures the sustainable development of the territorial unit due to increased efficiency in the use and development of the potential of economic, innovative and production systems. These processes, in turn, ensure the attraction of investment, economic and production growth of indicators, sustainable development of the region.

The Innovation Regional Cluster is a system of geographically located interconnected scientific and production enterprises with a large specific gravity of knowledge-based and innovative products that complement each other, based on the formation of a unified strategy for cooperation and management. As a result of mutually beneficial cooperation, the innovative potential of each of the cluster members is created and maximized, expressed in the creation of additional value added, which leads to an increase in the economic and financial performance of not only cluster education enterprises, but also the region.

Cluster education has a formed innovative infrastructure, which includes interaction between educational institutions, research centers, transfer centers for technological developments, business incubators, technology parks, financial institutions, etc. The cluster facilitates the implementation of all stages of the innovative production chain, from the generation of scientific developments formed in business plans to the implementation of innovative products. Clusters produce the generation of new technologies and developments through the use of growth factors such as intellectual capital, modern technologies, digital platforms, regional infrastructure, knowledge generation and the transfer of innovation, as a result of which there is an increase in innovative activity in the region.

Therefore, this innovative regional cluster is a mutually beneficial association of production enterprises, service organizations, research institutes, scientific centers and financial structures located in close geographical proximity, the result of which is the process of production of knowledge-based products. The innovation cluster has the following characteristics that allow it to be distinguished from other types of associations:

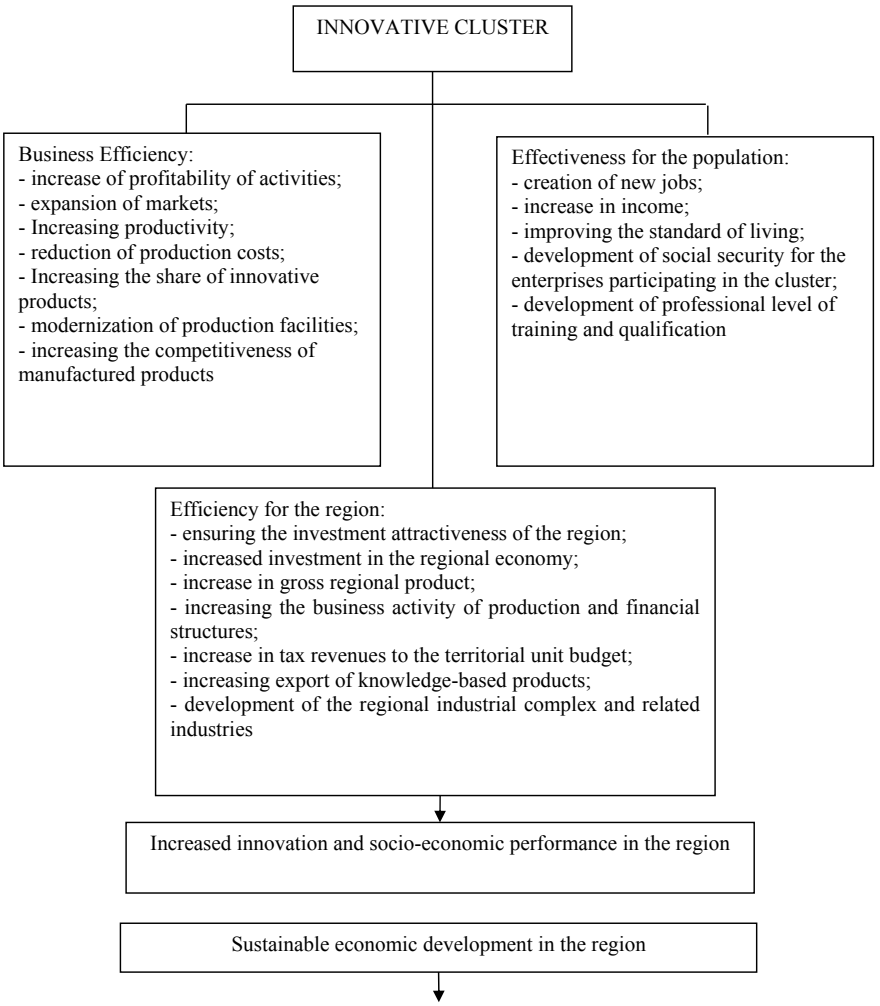

Fig. 1 Impact of the innovation cluster on the sustainable development of the region. *Source* Developed and compiled by the authors

(1) designing and creating innovative products or services that ensure a high level of profitability of all enterprises included in the innovation cluster;
(2) combining all stages of the production and technological process, including scientific, research and development developments, which are carried out by enterprises participating in cluster education;
(3) improvement of coordination and cooperation processes between the cluster members;
(4) achievement of positive synergistic efficiency by all enterprises included in the cluster, due to cooperative mutually beneficial relations;

(5) increase of the share of gross profit in revenues derived from the sale of goods and services as a result of the introduction of scientific developments and innovations in the production process of the cluster member enterprises;
(6) increase of specific weight of intangible assets in the total structure of assets of participants of cluster education.

The success of the innovation cluster depends directly on the level of its self-sufficiency in the process of uniting all participants into a single innovation system. Providing the cluster with a solvent market demand for final products is one of the main conditions for the effective operation of innovative clusters.

The innovation cluster has fundamental criteria: the presence of modern infrastructure; the use of digital and information and communication technologies; specialization in innovative developments and their introduction into production; Large data and information flows using the latest digital platforms and software products a certain structure of participants.

The model of functioning of the innovation cluster has been developed, whose activities are aimed at ensuring sustainable territorial development due to the integrated and effective use of economic and innovative technological potential.

Taking into account the specifics and features of sustainable territorial development based on the integrated and efficient use of economic and innovative technological potential, the authors proposed a model for the effective functioning of the innovation cluster (Fig. 2). The model takes into account the interaction of the cluster with internal and external factors, as well as the generation, transfer and commercialization of innovations.

The model of functioning of the innovative cluster developed by the authors includes a number of subsystems that form its properties. Such subsystems include: innovation financing subsystem, personnel support subsystem, promotion subsystem, science and innovation generation subsystem, innovation transfer subsystem, innovation commercialization subsystem. The effective operation of the model is achieved by the presence of interaction and feedback between all its participants and subsystems. In this regard, it is necessary to create an innovative technological infrastructure within the model, modernize the production enterprises of the innovative cluster, and ensure the transfer of scientific reserves to production.

Thus, the innovation cluster is an association, which includes enterprises of the scientific, industrial, financial, information spheres of activity. All subjects of the innovation cluster are in continuous interaction, using transport and technological infrastructure, influencing each other. Such mutually beneficial cooperation contributes to the development of new knowledge and innovations, the transfer of innovations, and the production of innovative products.

In the framework of the model proposed by the authors, we will identify and consider structural elements and subsystems.

The central element is the “core” of the cluster, that is, objects that perform a production and technological function and produce final products. “Core” is represented by industrial enterprises with regional specialization, around which the components of the unification subsystems are grouped.

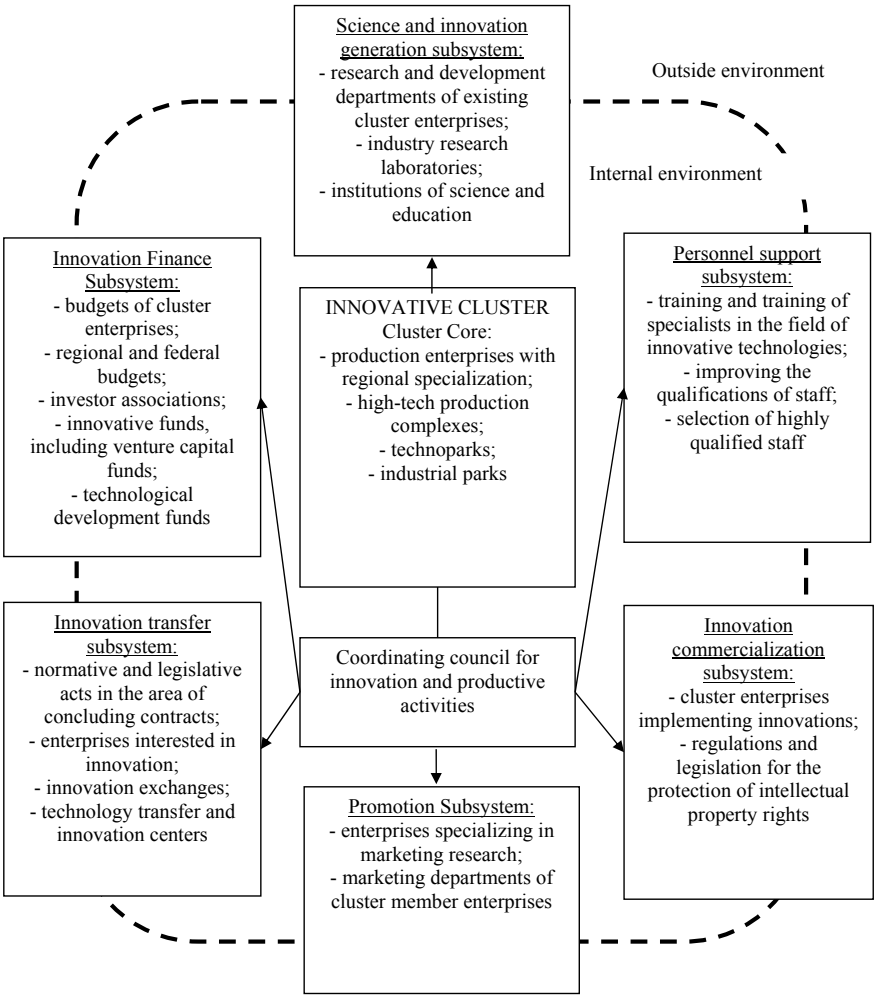

Fig. 2 Model of functioning of the innovative regional cluster. *Source* Developed and compiled by the authors

The Coordinating Council for Innovation and Productive Activities determines the strategy of the cluster and its development directions, while placing some of the risks on itself.

The innovation financing subsystem includes budgets at various levels and forms instruments to attract investment in the creation and production of new technologies and goods. The subsystem in question generates and generates monetary resources for innovative development.

The promotion subsystem is focused on identifying and studying market needs for knowledge-based products. The importance of the organizations and departments of

the existing enterprises of the cluster is very bike. The decision on testing and further production of innovative products is made based on marketing research. If there is an existing or potential demand in the market, it is advisable to decide to start production. To include organizations in the cluster that supply all types of resources, it is necessary to have a sales market for the products of the production enterprises of the cluster. The development of the innovation cluster and its constituent enterprises is directly dependent on the demand for innovative products, so marketing analysis should be regular.

The subsystem of science and innovation generation provides the process of obtaining new knowledge, which is carried out by institutions of science and education, research and development departments of scientific enterprises, and design bureaus. This sector has the function of finding ways to meet the need and demand for new ideas and knowledge.

Commercialization of new knowledge and technologies is transformed into goods by cluster organizations. Scientific and production enterprises of the cluster develop and produce knowledge-based products. The model should facilitate interaction between scientific and production enterprises through innovative infrastructure.

In order to ensure fair competition, it is necessary to use legislative and regulatory acts in the field of protection of rights to intellectual property.

The personnel support subsystem includes organizations for training and training of specialists in the field of innovative technologies, scientific institutes for advanced training of employees. The functional purpose of the system is aimed at providing the cluster enterprises with highly qualified specialists, a significant indicator of whose work is to increase labor productivity.

The innovation transfer subsystem contributes to the spread of innovation not only among the participants of the territorial cluster, between clusters, but also presents the possibility of access by all organizations interested in the latest technologies through technology transfer centers and the innovation exchange. The coordinating activities of federal and regional executive bodies will intensify the transfer of innovations between enterprises that are part of the cluster.

Therefore, the creation of innovative clusters contributes to the sustainable development of the territories within which they operate. The implementation of the cluster activities under the proposed model makes it possible to significantly increase the economic, production and investment indicators not only of the cluster member enterprises themselves, but also of the region as a whole.

4 Conclusions

The innovation cluster promotes sustainable regional development through the unity of the innovation financing subsystem, fundamental science and knowledge generation, high-tech production enterprises, the transfer and commercialization subsystems of innovation, as well as institutions of state regulation and assistance.

The model of functioning of the innovative regional cluster proposed by the authors ensures the most efficient and integrated use of the economic, technological and scientific potential of the territory. Only within the framework of the developed model are integrated production and technological projects formed to make effective financial decisions that increase the multiplier effect of sustainable development of the region and increase the competitiveness of the territorial unit in the world market.

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Clustering as a Model of Regional Development

Yuri N. Lapygin, Evgeny A. Kovalev, Svetlana N. Kuznetsova, Ekaterina P. Garina, and Elena P. Kozlova

Abstract The need to establish effective organizational structures in the region, ensuring the competitiveness of both business entities and the region as a whole, encourages the transition from linear-functional structures to cluster ones. The aim of the paper is to consider the clustering of the territory from a systemic perspective in conjunction with the category of "sustainable development" in the process of shaping the regional strategy. The authors research the clustering of the territory as a promising model for the integration of organizations in the region, in combination with the category "sustainable development" in terms of ensuring the interaction of economic entities in the process of forming a development strategy for the region. It is shown that the sustainable development of the region should be understood as the management of continuous changes aimed at the strategic development of the socio-economic system. It was established that in the process of forming and implementing the development strategy of the region, a combination of systemic, complex, process, and project approaches is used. It is proposed to apply cluster policies that ensure the implementation of innovative changes in the region as a model for the development of the region. A proposal was put forward as a promising model in the future to form a regional union of clusters, which, along with the authorities, will ensure the formation and implementation of a development strategy for the region. The analysis of the research work in the sphere of cluster development models of the region shows their increasing number and focus on the integrated consideration of various aspects of the construction and functioning of economic structures aimed at systemic integration, which confirms the relevance of the considered aspects of the transformation of modern socio-economic systems and the possibility of their reflection in regional development strategies. Cluster policy, as a model of transformation of the socio-economic system of the region, is a subsystem of the development strategy, and its

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implementation allows forming the reputation of the region as an attractive partner focused on innovative development and risk reduction.

Keywords Cluster · Structure · Strategy · Model · System · Region

JEL Codes O18 · O29

1 Introduction

The emergence of specific organizational forms at the present stage of turbulent competition in the market of goods and services led to the formation of cluster structures in the Russian regions (Tulinova and Lapygin 2018).

The competitive advantages of business clusters not only demonstrate development efficiency into regions and enterprises included in the cluster, but also become key factors for success in finding innovative directions for the development of the territory.

Cluster effects are due to the formation of a system in which such a property of systems as emergence is manifested, which underlies the implementation of the law of synergy.

Among the cluster effects, such characteristics as the combination of internal competition with cooperation, economies of scale, strengthening of competitive position in the market, reduction of transaction costs within the cluster, multiplier innovation, investment attractiveness of both cluster participants and the region as a whole are distinguished.

Internal competition increases the competitiveness of the cluster as a whole, and cooperation in asset sharing reduces production costs, which allows you to benefit not only in price competition, but also then increase sales, which, in turn, leads to additional savings from the scale of production.

Synergy arising in the process of interaction between cluster members forms new qualities in a set of enterprises that each cluster enterprise does not have separately, which also increases the competitiveness of the cluster structure.

The decrease in transaction costs is due both to the establishment of rules for interaction between cluster members (rationalization transactions) and to a decrease in costs from transaction transactions. And the increase in value added from the joint activities of cluster enterprises is rationally used in the interests of the cluster and the development of the region as a whole.

The cluster effects for the region also are in the fact the growth of the competitiveness of the cluster and its innovative development makes a multiplier effect, which is manifested in enterprises of the region belonging to related industries. The growth of revenues to the regional budget sent by cluster enterprises forms a reputation for the sustainable development of the region itself, which opens up additional opportunities for co-financing regional projects and attracts resources from external investors.

The use of cluster effects in combination with the digitalization (Urazbakhtina 2020) of the development of the socio-economic systems of the region not only increases the reputation of the region, but also opens up new opportunities for managing large systems, which include regional clusters, including the ability to form virtual clusters.

The goal of clustering, as one of the directions of the integration strategy for the development of the region, is not only to increase competitiveness and rationalize the technological chain of production, but also to integrate the potential of economic entities necessary for the strategic development of the region.

2 Materials and Method

The strategic development of modern Russian regions determines the content of the Federal Law "On Strategic Planning". However, it does not contain instructions on the formation of cluster structures in the region. Nevertheless, the practice of establishing strategies, for example, the regions of the Central Federal District of Russia, is replete with plans to establish clusters such as tourism and recreation, transport and logistics, agro-food, engineering, scientific and educational, pharmaceutical, innovative, etc. However, it should be noted there are only 4 innovative clusters, and most of all tourist and recreational clusters—12 clusters (Lapygin 2019). This distortion indicates a lack of methodological development in the cluster policies in the development strategy of the region.

The cluster approach in the development of both enterprises and the region itself is based on models of regional development not only in the implementation of management functions (forecasting, planning, organization, coordination, accounting and control), but also specific planning models, based on strategic management methods and tools.

In the structure of strategic management, the procedure for constructing the strategy structure is distinguished, based on the priority directions of the region's development, which are determined by the results of the analysis of factors of the external and internal environment, taking into account the construction of the target strategy block, including the Vision, the Mission, and a set of strategically relevant objectives.

The procedures for constructing the strategy structure often result in cluster policies as one of the functional development strategies of the region. Development in this case is viewed from the perspective of sustainable development, although "sustainability" and "development" as categories of scientific paradigm do not accurately reflect the essence of the necessary strategic changes in the region.

In the formation of cluster policies, as a model of regional development, a systemic approach is preferred, although during the development of the strategy both process, project and complex, and scenario approaches are used.

The systemic approach allows explaining the manifestation of special cluster effects arising in the process of implementing such a law of general system theory

as the law of synergy, based on such a systemic property of systems as emergence. And such a system category as a configurator gives an idea of the possibility of describing cluster structures in various languages of description: economic, social, organizational, digital.

3 Results

Development, as one of the categories reflecting changes in nature and society, is considered in the present research from the perspective of the general theory of systems. The very category of "system" from ancient times reflects the integrity and order of real reality. Currently, researchers on issues of general system theory note the existence of dozens of definitions of the "system" concept (Volkova 2014), which reflects the multidimensional nature of this phenomenon and the development of the theory itself in terms of solving control problems. The general theory of systems developed in the twentieth century in the works of Alexander Bogdanov (Malinovsky), Ludwig von Bertalanfi, as well as Norton Wiener, Igor Blauberg, Eric Yudin, Vadim Sadovsky, Mikhailo Mesarovich, Avenir Uemov, Yuri Chernyak, William Eshbi.

In our research, it is advisable to adhere to the definition of a system, according to which is "a holistic set of interconnected elements that has properties different from those of the elements that form this set", and development is "a collection of related and directed changes in the properties and processes of the system". In this regard, the development of the system is subject to the law, which in the theory of systems reflects the desire of any system to realize its maximum potential, passing through all stages of its life cycle. It is fundamentally important that changes in the system are continuous (only the speed and sign of changes change), and the speed of change in the potential is determined by the initial potential of the system. At the same time, it seeks to stabilize the range of changes in the potential of the system, which do not begin immediately after the start of exposure to the system from the outside and continue some time after the end of such impacts.

The scientific literature has established such a category of management as "sustainable development", however, by definition, "sustainability" represents such a quality of the system as its ability to maintain its current state under the influence of environmental factors, while development is oriented towards change, "constant evolution" (Selezenev 2019).

Studying the theoretical aspects of the "sustainable development" concept, the authors (Balashova and Sharipova 2019) believe the generally accepted definition has not been developed due to its interdisciplinary nature, but agree with the position of the predecessors that sustainable development is more a process of continuous balanced and positive changes. That is, it is a management process which the changes themselves as phenomena are stable in. This is also evidenced by the law of the development of systems in terms of the principle of continuity of changes. Therefore,

it is more accurate to talk not about managing "sustainable development", but about managing continuous change.

Considering aspects of the modern paradigm of systems' sustainable development, Professor of Donetsk University (Ivanova 2020) writes such development should pre-empt and mitigate threats by strategically anticipating options for changing the system. And researchers from the Kuban State Technological University (Udovik and Ibragimova 2020) in the issue of the sustainability of the socio-economic systems' development emphasize public–private partnership and state regulation of the economy. Other researchers, agreeing with the need to form a strategy for the socio-economic system's regional development, note the specifics of sustainable development in terms of developing innovative potential (Gerasimov 2019), taking into account the impact of external development factors (opportunities), including institutional factors (Turbeyev 2020). Researchers assign an important place in the implementation of the process due to consideration to development effectiveness, the assessment of which is carried out according to the results of monitoring based on indicators of sustainable development (Bolshakov and Shamaeva 2019).

The region in this case should be considered from the point of view of the definition of Granberg (2004) as "a certain territory that differs from other territories in a number of features and has some integrity, interconnectedness of its constituent elements".

The scientific literature studies the methods and methods of functioning of the regional management system (Zhuravlev 2019), studies the established models of regional development (Gerasimov 2019), as well as the construction of models for the development of the structure of regional subsystems and the development of the methods of research of regional subsystems (Krotova and Kovaleva 2019).

But in general, the description of a region as a socio-economic system can be performed by describing the elements it consists of, the connections between the elements and the interaction with the external environment (Kochkina et al. 2017). The external environment in this case refers to everything that does not belong to the region.

The cluster external environment (Fig. 1) includes both near and far environments. The immediate environment of each cluster is specific and includes cluster competitors, suppliers and consumers, as well as infrastructure and authorities that stimulate and facilitate the development of the cluster and its formation of a management company. At the same time, the distant environment has an indirect effect on the cluster and traditionally includes state policy, economic content factors, the specific influence of the country's population (society with its written and unwritten rules), as well as the innovative component of scientific and technological progress (technology), environmental features arising from cluster activities, and institutions. Institutions in this case are the framework that limits the behavior of the cluster—laws and by-laws.

But the description of the region from the standpoint of a systemic approach can be a configurator (Lapygin 2015), reflecting the content and connections of parts of the region in various languages of description: social, economic, environmental, institutional, strategic, etc. So, the description of the development strategy of the region includes not only the morphology of the target subsystem (Vision, Mission,

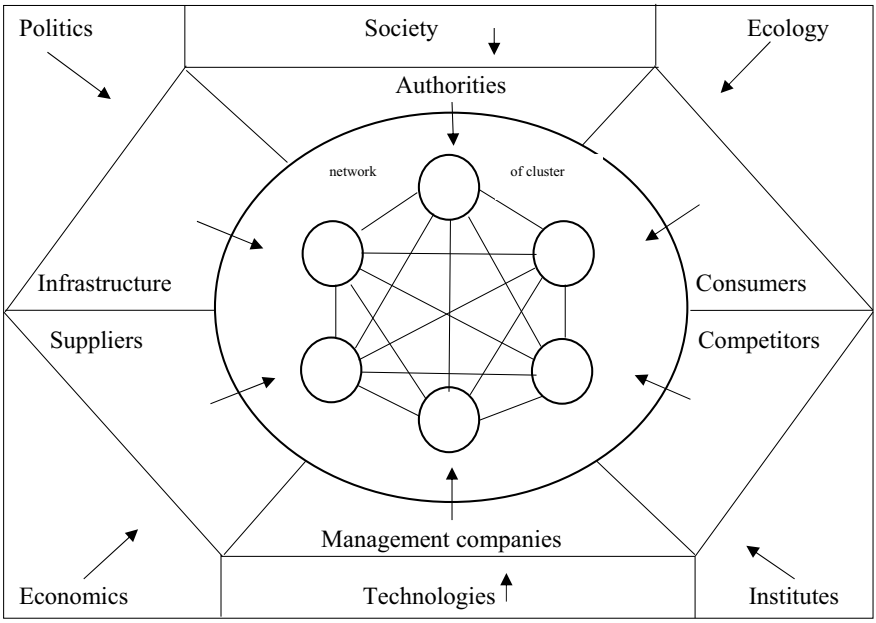

Fig. 1 Cluster environment factors. *Source* Developed and compiled by the authors

set of specific goals), but also the substantive subsystem of the strategic plan: policies, projects and programs. One of the policies (cluster) is of particular interest in terms of regional development prospects.

However, along with a systematic approach to the study of regions, researchers resort to a process (Gerasimov 2019) and design (Miroshnikov 2019) approach as the development strategy of the regions is formed (Sivyakova and Lapygin 2019).

Process management, based on a repeating set of procedures to obtain the desired result, ensures the implementation of the development strategy of the region and has its merits according to the estimates of researchers (Ishkova 2016).

The essence of the project approach, as an instrumental implementation of the strategic management of socio-economic systems (Aborina 2019), lies in its targeted focus on the result, when the start and end of project activities are determined, as well as the activities and resources for the implementation of such activities. There is also a tendency in the application of project management at the regional level in relation to the participation of government and management bodies in the formation and implementation of strategically significant projects both in terms of the implementation of national projects and in relation to projects aimed at the implementation of regional development strategies (Miroshnikov 2019).

The considered approaches in practice are used in the strategic management of the development of modern Russian regions both at the stage of developing the strategy (Elokhov and Alexandrova 2020) and at the stage of its subsequent implementation

(Tulinova and Lapygin 2020), in which the trend of cluster development of the regions is manifested.

Along with the analysis of existing models of regional development, researchers are increasingly considering the issues of successful clustering of regions both in terms of establishing regional and interregional clusters and in terms of proposals for combining regions into "subject clusters" (Astakhin 2019). In some cases, the effects of the strengths of special economic zones in combination with clusters are considered, the conditions for cluster formation are distinguished, and methodological approaches to the creation of clusters themselves are proposed (Zverev et al. 2019) based on the analysis of best cluster practice. At the same time, it is noted cluster policy does not always provide visible results (Korostyshevskaya and Shumova 2019), since its implementation faces problems in the regions.

Thus, it should be noted to ensure the sustainable development of the regions based on the construction of a set of clusters, it is necessary to form a system for managing continuous changes in the process of implementing the strategy of socio-economic development of the territory, using cluster effects to improve the life quality of the people, living in the region.

Ideally, when the region is 80 per cent clustered, we could talk about its complete clustering, followed by the creation of a new model for managing the region's economy, which provides strategic development. The essence of the model is a set of clusters, which could be united into a super-cluster in an organizational and legal form resembling an alliance of producers. In turn, they could become the third branch of government, along with the executive and legislative authorities of the region. Such an alliance could determine the prospects for the strategic development of the socio-economic regional system.

4 Conclusion

In conclusion, the strategy, as a model for achieving the development goals of the region, usually contains a cluster policy and is aimed at integrating business entities to realize the cluster effects noted above, which strengthen the reputation of both the region and the clusters themselves. In this case, both reverse vertical integration and forward vertical integration are possible, as well as horizontal integration of enterprises in the region.

However, to fully realize the synergistic effects of clusters, an adequate infrastructure of the region is necessary for their requests, as well as preferences on the part of the regional authorities in initiating the clustering process and issuing guarantees for the implementation of cluster projects and programs.

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Comparison of Indicators of Human Resources Involvement in Regional Innovation Processes and Digitalization of the Economic Structure

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Abstract Purpose is to analyze the dynamics of efficiency indicators of human resources in the regions of the Russian Federation in conditions of economy digitalization. The methodological basis of the study was the work of modern scientists, revealing the prospects for the development of advanced technologies and related problems in building the personnel potential of the territories. On this basis, two parameters are proposed for assessing the results of labor force involvement in the format of the new economic structure. The first of them characterizes the specific return on the working-age population in innovative processes. The second indicator directly reflects the level of development of scientific personnel, testifying to the rationality of scientists and the degree to which their direct functions are implemented in a particular region. Results of the study interpret the nature of changes in inter-territorial imbalances according to the selected key criteria, and also make it possible to identify the most and least successful socio-economic systems in terms of the efficiency of human resource development. Conclusion on the direct impact of the effectiveness of scientist's activities on the level of technological transformations in the district under consideration is quantitatively confirmed. Recommendations are given on the use of developed assessment tools during the period of mass digitalization, and the prospects for improving the formed methodological approach are substantiated.

Keywords Human resources · Digitalization · Regions · Efficiency

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1 Introduction

Human resources are a key mechanism in the implementation of territorial innovation transformations. The level of education, initiativeness, and motivation of existing personnel affect the region's productivity indicators, as well as general economic and social indicators, defining the economic rank of the subject in relation to others. In turn, the intensification of the spread of modern digital technologies can provoke certain problems for the life of territorial systems: an increase in unemployment due to the development of automated processes in industries that require minimal human involvement; marginalization of the population; cybercrimes; the emergence of catastrophic differences in the quality of life due to the uneven penetration of modernization processes into the country's space.

In this regard, the problem arises of finding a certain balance between the accelerated speading of new knowledge into almost all national economic spheres, which significantly reduces the laboriousness of carrying out specific activities. This study tasks of calculating the efficiency of the use of human resources in regions and analyzing obtained results in relation to the period of economic digitalization are solved.

2 Materials and Method

In the new economic conditions, which the scientific and political circles traditionally associate with modernization (or neo-industrialization, expanded reproduction, the knowledge economy, etc.), the most prominent place is given to achieving positive demographic dynamics and increasing labor productivity of human resources. But it seems particularly important to note that indicators of population growth should be closely correlated with changes in their output. Only in this case can we ascertain the high efficiency of demographic processes and argue about increasing the use of human resources.

According to the fair remark of Yu. A. Petrovskaya, in itself, meaningful innovation requires the ability to use their wide range in the most unpredictable situations (Petrovskaya 2019). In addition, according to the research of M.E. Baskakova and I.V. Soboleva, along with the physical leaving of personnel for the development of digital technologies of human capital (Baskakova and Soboleva 2019).

Sufficiently qualitative comments of the issue under consideration were formulated by A. G. Gadzhieva and A. Martynov According to her, in recent decades, rapidly developing technologies have contributed to changing the structure of employment, professional, scientific and technical services (Gadzhieva 2018; Martynov 2014).

Automation of routine processes can lead to lower wages, higher inequality, layoffs, and the inability to retrain employees and create jobs in digital economy in a short time. According to researchers, in the event of a simultaneous onset of automation. The described scenario is unlikely happen, but with the development of new technologies in the regions, social risks also increase, since for a significant proportion of the population there are problems of retraining (Zemtsov 2018).

Therefore, to justify corrective decisions and optimize unsatisfactory results, it is necessary to obtain current and forecast estimates of the degree of labor involvement and intellectual potentials of the population in innovative processes (Ilyin and Shabunova 2014).

This study attempts to compare the effectiveness of the development and use of human and scientific potential by the example of the regions of the Central Federal District (CFD) according to official statistics[1] (Federal State Statistics Service (2021).

We have the basic criteria.

(1) The efficiency of use of human resources E in the ith territory in the analyzed period (1):

$$E_i = \frac{V_i}{P_i}, \tag{1}$$

where

V_i the volume of innovative goods, works, services;
P_i the average annual number of labor.

where

T_i the number of developed advanced production technologies, units;
N_i the number of personnel engaged in research and development, people.

The first indicator characterizes the average performance of involving a working population in innovative processes. Ehe second indicator directly reflects the level of development of scientific personnel and testifies to a certain extent about the meaning of the implementation of their direct functions, as well as the rationality of the scientist's activities in a particular region.

3 Results

The per capita return in the form of innovative products in the CFD in the last 2 reporting periods (2017–2018) is inferior to the corresponding indicators for the country as a whole. However, in some regions (Belgorod, Lipetsk, Moscow and

[1] Federal State Statistics Service: [site]. http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/. Access date 03/08/2020.

Tula), over the same time interval, a 2 or even threefold excess of the values E_i over the specific values achieved in Central Russia and the Russian Federation is shown (see Table 1).

The range diagram obtained from the calculation results (Fig. 1) is set by the following regression function: $E_i = -313.48 + 3.04t$ where t is the year. The value of the correlation coefficient ($r = 0, 59$) and an acceptable level of significance of Fisher statistics ($p \approx 0$) indicate the adequacy and good prognostic properties of the generated model (Fig. 1).

The graph clearly shows that from 2008 (the period of the global financial crisis) to the present moment, significant inter-regional differentiation according to the indicator under consideration is gaining momentum. This fact cannot but cause concern at the federal level, especially because of the growing and widening imbalances long before the sanctions (which have gained momentum since 2014), which are traditionally recognized as the most difficult for the Russian economy.

Table 1 E_i in the Russian Federation

Territory (region) / year	2000	2004	2007	2010	2012	2014	2015	2016	2017	2018
RF	2.40	6.55	14.10	17.40	39.79	49.67	53.07	60.56	58.00	63.11
CFD	2.78	5.24	11.98	13.99	44.28	51.01	70.43	79.21	52.68	55.73
Belgorod	0.51	2.83	19.71	12.53	27.80	30.21	38.92	74.54	133.49	185.09
Bryansk	0.55	4.34	13.43	7.63	19.03	14.90	46.46	55.77	23.01	11.92
Vladimirskaya	2.25	3.40	9.97	7.39	39.53	34.02	40.66	32.84	53.12	27.22
Voronezh	0.91	3.44	15.10	11.59	14.08	22.13	45.88	24.77	29.47	32.65
Ivanovo	0.62	0.48	5.04	5.30	1.11	1.74	2.97	0.58	0.48	1.65
Kaluga	3.87	7.35	9.86	13.91	38.21	26.44	29.20	27.47	32.83	41.75
Kostroma	0.80	3.75	3.02	6.59	10.70	8.14	7.34	31.17	50.18	41.18
Kursk	1.20	1.30	4.12	1.84	11.73	25.24	29.00	47.44	58.43	95.46
Lipetsk	1.84	14.46	18.47	53.00	73.68	105.59	114.70	117.14	111.54	115.89
Moscow	3.07	12.47	29.50	27.00	54.63	78.84	87.33	105.73	111.39	105.66
Orlovskaya	2.41	3.41	6.18	17.14	2.77	2.60	2.23	2.63	4.45	4.71
Ryazan	2.32	2.31	5.69	8.50	9.90	14.20	16.33	34.70	38.92	37.87
Smolenskaya	0.31	1.27	3.44	4.88	6.59	22.21	12.02	9.01	22.73	12.92
Tambov	0.45	2.89	6.95	4.18	6.99	12.50	14.34	16.93	26.87	39.59
Tverskaya	3.62	3.61	5.46	22.09	26.24	7.01	20.37	25.84	16.48	26.58
Tula	1.77	2.29	4.52	10.90	65.88	55.84	84.99	90.37	112.34	117.77
Yaroslavskaya	3.24	6.45	9.83	32.72	52.92	42.31	28.40	76.85	74.96	78.50
Moscow	4.55	4.06	7.91	8.20	59.23	64.09	99.04	104.79	28.52	32.08

Source Developed and compiled by the authors on the materials of Federal State Statistics Service(2021)

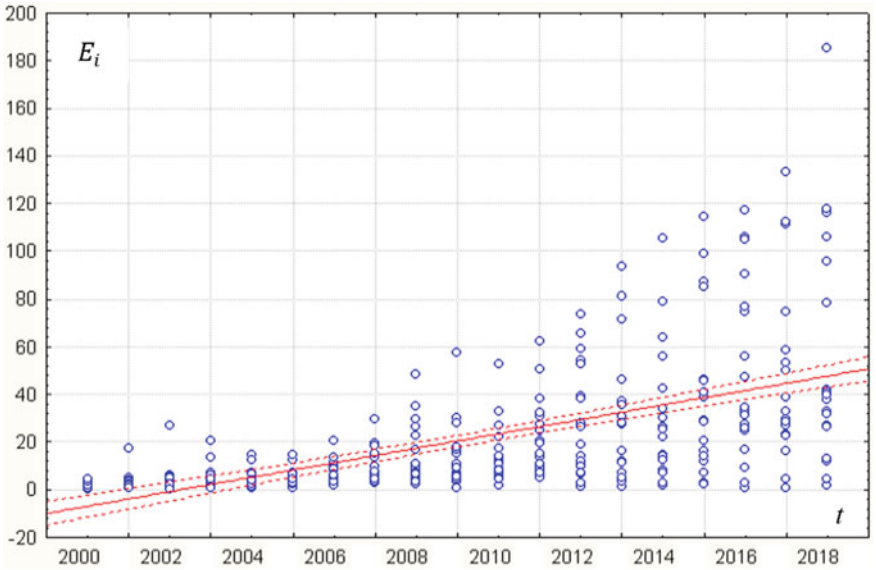

Fig. 1 Diagram of the range of values E_i over time by CFD for 2000–2018. *Source* Developed and compiled by the authors

In addition, E_i Bryansk, Oryol, and, especially, Ivanovo regions demonstrate frankly weak growth dynamics during the analyzed period. Despite the presence, and even a substantial concentration of higher education institutions in these regions, the problem of ensuring and developing high returns in the form of innovative products from knowledge-based personnel is quite serious. One of the main reasons, of course, is the massive outflow of specialists to other subjects of the country with more attractive living conditions. For example, in the Ivanovo region, the necessary personnel are annually issued for medicine, agriculture, the chemical industry, energy, construction, etc. But the region will inevitably lose its human resources prepared for work, which are "being dissolved" in Moscow, the Nizhny Novgorod region, and even in St. Petersburg.

An analysis of changes in the second indicator S_i opens up an even less expressive picture of the ongoing transformations, which are associated with the absence in the regional economic system of extremely clear and sustainable growth in the research sector's effectiveness. Also, the focus especially relevant during the period of declared programs in the country digitalization and import substitution.

A fragment of the results obtained for the calculation S_i of indicators, similar to the previous evaluation stage, is presented in Table 2.

Graphical interpretation of the productivity values of scientists (S_i) by CFD for 2000–2018 shown in the range diagram (Fig. 2).

The graph clearly shows that for the analyzed 19-year period, the median technologies created does not exceed 4 units per 1000 researchers!!! Not the most "outstanding" situation, the Belgorod, Bryansk, Smolensk, and in part, Kaluga regions

Table 2 S_i in Russia

Territory (region) / year	2000	2004	2007	2010	2012	2014	2015	2016	2017	2018
RF	0.78	0.81	0.97	1.17	1.82	1.92	1.89	2.12	1.98	2.29
CFD	0.57	0.49	0.68	0.95	1.02	1.13	1.36	1.45	1.32	1.55
Belgorod	5.12	14.38	10.65	8.41	15.27	7.28	18.87	29.70	22.36	38.72
Bryansk	1.15	0.00	0.51	6.33	9.39	7.52	12.42	20.63	23.26	23.95
Vladimirskaya	0.84	1.04	2.15	0.00	1.41	1.94	2.63	2.03	1.86	1.77
Voronezh	1.60	1.23	1.13	1.59	0.83	2.85	2.36	2.52	2.44	2.28
Ivanovo	0.00	0.00	0.00	0.00	11.74	1.20	31.55	43.69	40.07	24.39
Kaluga	0.93	0.37	1.74	2.58	4.05	2.74	4.42	3.81	4.96	5.69
Kostroma	9.84	6.29	29.20	17.24	42.02	0.00	0.00	0.00	0.00	0.00
Kursk	0.00	0.61	0.30	0.00	0.99	0.00	0.00	0.00	0.00	0.00
Lipetsk	0.00	0.00	0.00	0.00	2.74	4.51	1.43	1.62	0.00	8.99
Moscow	0.41	0.28	0.67	0.78	0.79	0.80	0.79	1.24	1.17	1.54
Orlovskaya	0.00	7.14	4.97	6.27	0.00	0.00	0.00	1.14	2.39	5.46
Ryazan	2.47	0.00	0.00	0.42	0.84	1.98	1.94	1.84	2.84	4.37
Smolenskaya	1.81	3.04	4.57	2.29	1.24	11.66	9.80	13.14	13.29	21.18
Tambov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tverskaya	2.17	0.36	0.37	0.62	0.45	1.16	0.44	0.68	1.76	3.24
Tula	1.56	0.39	0.80	2.00	3.63	1.81	1.44	0.71	0.00	0.24
Yaroslavskaya	0.54	0.40	1.67	0.81	2.85	6.00	3.17	5.31	4.56	4.21
Moscow region	0.42	0.43	0.48	0.85	0.74	0.86	1.08	0.89	0.73	0.71

Source Developed and compiled by the authors

look much more preferable than other regions showing stagnation, low (zero) results, or deterioration of analyzed indicators.

Moscow is characterized by a very modest dynamics of the productivity of scientific personnel, which is traditionally considered as the flagship of the dissemination of advanced technologies, concentrating a significant number of specialized organizations in the field of reproduction of new knowledge. In reality, the capital has one of the lowest rates of return on employees (S_i) involved in the research sector of the national economy. By 2018, its value reached only 0.71 and increased compared to 2000 (0.42) by less than two times (see Table 2). Such transformations, of course, cannot be associated with tangible progress, especially with regard to the central region of the country.

Positioning of two analyzed indicators (E_i, S_i) in the coordinate system allows to identify trends and patterns for solving the problem of accelerated innovative development and mass digitalization of this territory (Fig. 3).

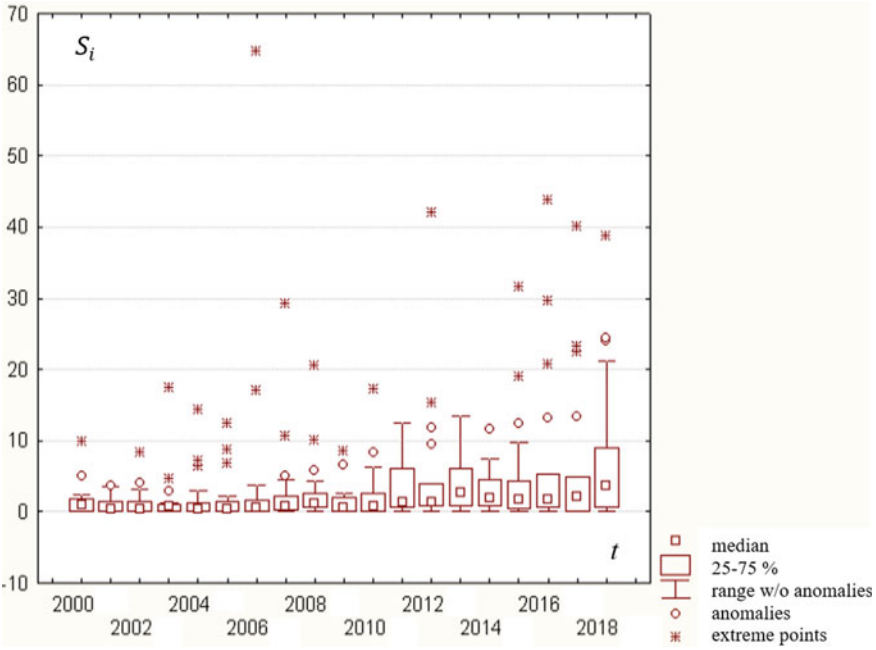

Fig. 2 Range diagram of the productivity values of scientists (S_i) by CFD for 2000–2018 (designation: "Median"—average value S_i). *Source* Developed and compiled by the authors

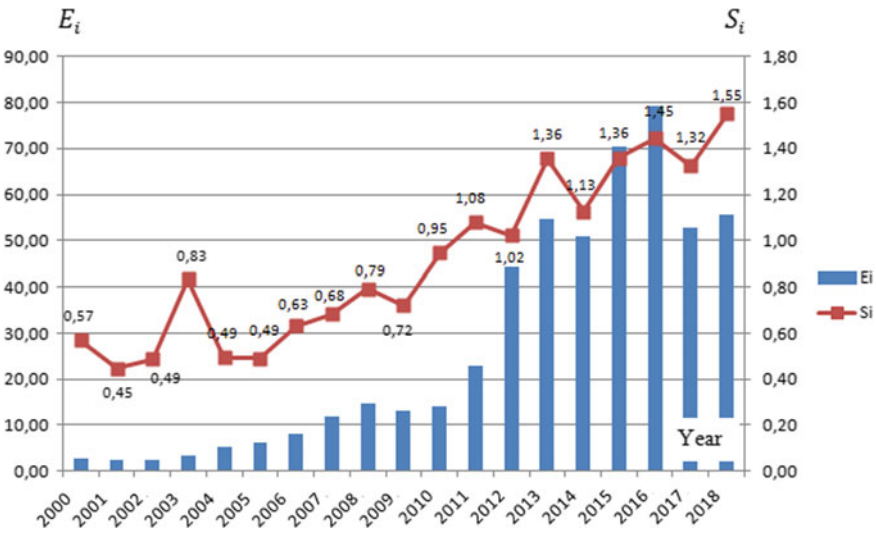

Fig. 3 Comparison of indicators of human resources in the innovation processes of the Central Federal District for 2000–2018. *Source* Developed and compiled by the authors

To date, we can state the fact of a slight improvement in indicators and the absence of pronounced steady dynamics of their change. It should be noted a strong relationship between the two factors, which confirms the high value of the pair correlation coefficient ($r = 0.92$). On this basis, it is advisable to draw conclusions that the effectiveness of the activities of research workers directly affects the level of technological transformations in the district under consideration, and the activation of the first factor should increase the efficiency of human capital and strengthen its role in the transition of the economic system to a fundamentally new path of economic growth.

The results obtained in the study are somewhat consistent with the conclusions of G. V. Osipov. According to him, during the period of updating information and intellectual technologies, human potential and scientific knowledge become the determining factors in the functioning of world or national communities and the sources of formation of surplus value (Osipov 2013; Sukharev and Neshitoy 2011).

Solving the problem of personnel for new industrialization O.N. Smolin, for example, sees a radical improvement of education funding to at least average indicators (4.7% of gross domestic product (GDP)) by countries participating in OECD, and ideally up to 7% of GDP, as was the case in all States that carried out accelerated modernization. So, in 2015, Russia took the 29th place out of 33 in the ranking of OECD territories (Smolin 2018; Vertakova and Plotnikova 2018).

4 Conclusion

The proposed assessment approach is open for inclusion of other, including combined indicators, in accordance with the stated research objectives, focused on identifying the prospects for development of human and scientific potential in specific socio-economic systems.

Calculations can be used by territorial administrations to analyze the effectiveness of human resources and formulate mechanisms for their motivation at the mesoscale due to the development of special programs to support young scientists, researchers and specialists involved in modern branches of knowledge and advanced sectors of the national economy to ensure favorable living conditions and development regions during the period of mass digitalization.

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Ecosystem Approach for Assessing the Socio-economic Development of Industrial and Regional Systems in the Context of Digitalization

Tatyana O. Tolstykh, Nadezhda V. Shmeleva, Elena A. Alpeeva, Diana Yu. Boboshko, and Tatyana B. Malkova

Abstract To develop a methodology for assessing human capital based on the ecosystem approach, taking into account the new paradigm of socio-economic development of the society in the era of intelligent machines, and to test this methodology on the example of the ecosystem in the Yaroslavl region. The methodology for assessing the impact of human capital on the region's investment attractiveness is based on methodological approaches proposed by the RF Ministry of Economic Development, the Agency for Strategic Initiatives, and the RAEX National Rating Agency. The authors propose to use the correlation-regression model to assess the relationship of investment attractiveness of the region and human capital. The volume of investments in fixed assets and the average annual number of employees were used as calculated indicators. On the basis of the correlation-regression model, the relationship of investment attractiveness of the region and human capital is established. As calculation indicators the volume of investments in fixed capital and the average annual number of employed people for the ecosystem of Yaroslavl region were used. It has been found that the high level of human capital affects the creation of a favorable business environment and is the basis for the development of ecosystems, including industrial ones. The results of the study, brought to the level of practical recommendations, which can be used by managers and specialists of executive authorities in developing strategies for the socio-economic development of the region. Features of functioning of socio-economic systems in the conditions of digitalization are defined. It is proposed to consider human capital as a tool for the formation of a qualitatively new techno and business environment along the entire value chain. Methodological approaches to assessing the impact of human capital on the investment attractiveness of the region have been developed.

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Keywords Socio-economic development · Human capital · Investment attractiveness of the region · Labor market · Regional ecosystem

JEL Codes C 1 · C 5 · J 6 · O 15 · P 5 · B 24

1 Introduction

In the conditions of sharply changing economic trends in the global market situation, associated in many respects with the rapid development of digital technologies into practically all sectors. The task of creating human capital that is adequate to macro environment trends comes to the fore. This task requires rethinking existing models from the perspective of their impact on the development of other industries and the economy as a whole.

Assessing the role of human potential as a way to create a fundamentally new technological and the business environment, studying the transformation processes of individual industrial systems and assessing the interaction of industry processes, taking into account the impact of human capital along the entire value chain (Tolstykh et al. 2018a, 2018b). In order to do this it requires an interdisciplinary approach in the field of management, research methods, systems modeling, as well as information technologies.

According to the authors, investment attractiveness and human capital are key factors that determine the competitiveness of the region. The balance of these two factors allows the timely introduction of innovative technologies that create potential for regional competitiveness in the era of intelligent machines (Shmeleva 2018).

State regional policy is built in accordance with the forecast assessment of investment attractiveness in a particular region. In this regard, in our opinion, it is advisable to apply the ecosystem approach in developing the investment program of the regions. Ecosystems provide an innovative landscape of a territory where financial flows and new knowledge are formed and function by combining the resource base.

2 Literature Review

The analysis of domestic and foreign literature allowed determining the peculiarities of functioning of socio-economic systems. As G.B. Kleiner points out, socio-economic ecosystems are now becoming central to the socio-economic landscape of the country's territories (Kleiner 2018). According to forecasts of McKinsey experts (Makafi and Brignolfson 2018) by 2025 a significant proportion of value chains will be combined into several dozen ecosystems, and the boundaries between individual sectors will be erased. Kelly (1995) believes that a new level of organization has been formed. Many companies that previously acted as companies of a traditional organizational form are transformed into ecosystems.

In the course of their life, each system in a free socio-economic space seeks to make up for the shortage of space–time and other resources that are scarce for itself, for which it enters into stable alliances with other systems that have this type of resources in excess (Markova 2018).

A feature of the regional ecosystem is that it is both a consumer and a customer of innovative technologies, products, and services (Preobrazhensky et al. 2019). Accordingly, to achieve the competitiveness of the region, it is necessary to create comfortable conditions for attracting and retaining qualified personnel, in other words to form social capital (Pasquale and Glaeser 1999). The term "social capital" was first defined in Lyda Hanifan's book "The Rural School Community Centre". She believed that social capital was a material asset present in people's daily lives (Hanifan et al., 1921). In the Russian scientific community, the definition of "social capital" is touched upon in the scientific works of professors of the National University of HSE and Moscow State University named after Lomonosov. They define the term "social capital" as values that make us remember the interests of those around us (Akhtarieva 2014).

In this work, "social capital" is defined as the totality of social actions aimed at improving the quality of life, as well as communication within groups, including trusting relationships between participants. And the term "investment attractiveness" is considered as an integral characteristic of investment potential and investment risk, which determines the possibilities of human capital.

The theoretical basis of this study was the published works of such scientists as Kolmykova et al. (2018) and Henderson et al. (2016).

The authors also used "Framework for Creating a Smart Growth Economic Development Strategy" (Framework for Creating a Smart Growth Economic Development Strategy 2018), XXIV annual rating of investment attractiveness of the regions (XXIV annual rating of investment attractiveness of the regions 2018), Methodology of drawing up the rating of investment attractiveness of regions in Russia of the company "RAEXAnalytics" (Methodology of drawing up the rating of investment attractiveness of regions in Russia of the company "RAEXAnalytics" 2019) and National Rating Agency (Rating and Agency 2019) in this study.

3 Methodology

The method of estimating the impact of human capital on the investment attractiveness of the region is based on methodological approaches developed by the Ministry of Economic Development of the Russian Federation, the Agency for Strategic initiatives, the National Rating Agency and RAEX.

In the process of assessing the investment attractiveness of the region, the following factors are taken into account: the dynamics of the gross regional product (GRP), production capacities, resource and raw materials potential, the level of development of human capital, economic and political risks.

The authors propose to use the correlation-regression model to assess the relationship of investment attractiveness of the region and human capital. The volume of investments in fixed assets and the average annual number of employees were used as calculated indicators.

Reliability of the prediction carried out with the help of the correlation-regression model depends on the following conditions:

- The studied populations have a normal distribution;
- Factors do not repeat each other.

Time series can have a trend or be stationary.

In order to determine the type of trend, the smoothing method is used, namely the moving and exponential average. When using the moving average method, the interval m = 2 is specified, with an exponential average $\alpha = 0.1$.

In order to test series independence, the correlation coefficients of Spearman rank are determined:

$$r_{\text{cn}} = 1 - \frac{6 * \Sigma \Delta_i^2}{n^3 - n}, \tag{1}$$

where Δ is the difference between the ranks of levels and the numbers of periods.

When $r_{\text{crr}} = 1$, the complete stability of the selected trend is determined; when $r_{\text{crr}} = 0$ there is complete instability of the trend.

Further, according to the data of the time series, we calculate the medians of the average annual number of employees and investments in fixed assets:

$$\text{Me} = \frac{x_{n+1}}{2} \tag{2}$$

where n^n is the number of values.

A time series consists of random variables if the following two inequalities are performed:

$$K[3, 3 \cdot \log(n+1)]_{\max} V(n) > \left[\frac{1}{2} \cdot (n + 1 - 1.96 \cdot \sqrt{n-1})\right], \tag{3}$$

where n is the number of levels;

$V(n)$—number of series;

$K_{\max}$—the length of the largest series (a series is a sequence of identical marks).

Thresholds: $K_{\max} < 4293$, $V(n) > 5, 84$.

To evaluate the reliability of parameters in the equation and adequacy of the model, the "zero" hypothesis is put forward, the level of significance of the criterion is given, which is representing the probability of erroneous deviation "null" hypothesis. At the end there are points dividing the range of values into three segments: implausibly

small, implausible large and implausible values, then certain values are substituted into the function and the probability of the truth of the "null" hypothesis is determined.

4 Results

The information base for calculations is the annual reports of the administration of the Yaroslavl region in the period from 2000 to 2018, as well as the information of the agency of strategic initiatives on the results of activities industrial ecosystem in Yaroslavl region. The main participants in the ecosystem are the Novo-Yaroslavl Oil Refinery (Slavneft-YANOS), the Yaroslavl Rubber Products Plant (YaZRTI), the Yaroslavl Oil Refinery named after D.I. Mendeleev, Yaroslavl Tire Plant (YaShZ), Yaroslavl Plant of Metal Structures, Tutaevsky Motor Plant and Rybinsk Cable Plant. All calculations were performed using the software package for statistical data analysis SPSS (Statistical Package for Social Science).

We establish the relationship between the volume of investment in fixed assets and the average annual using the correlation-regression model on the example of the Yaroslavl region. At the first stage check the independence of the series by calculating the autocorrelation coefficients (Table 1) with the formula (1):

Comparing the values of autocorrelation coefficient with the critical value at the significance level $\alpha = 0.05$ (tabular value r_{table} $(0.05) = 0.299$), we find that all indicators are larger than the tabulated one, therefore, we cannot talk about the absence of autocorrelation.

Next, we calculate the medians of the time series (formula 2) for the average annual number of employees and investments in fixed assets (I). The median for the population: $Me = 656.2$. Median for investment in fixed assets $Me = 51,923$. Compare the levels of the time series with the median (Table 2).

In determining the composition of the time series (formula 3), the following values were obtained:

- The average annual number of employees: $V\ (n) = 3$; $K_{\max} = 9$
- Investments in fixed assets: $V\ (n) = 2$; $K_{\max} = 10$.

Thus, inequalities $K_{\max} = 5.175$ and $V_n = 12,7$ are not satisfied. Therefore, the data of time series does not consist of random variables. Therefore, statistical conclusions cannot be considered reliable for any of the series.

Table 1 Autocorrelation coefficients

Indicator	Autocorrelation coefficient
Average annual number of employees	0.735
Fixed investment	0.953

Source Compiled by the authors

Table 2 Comparison of the levels of the time series with the median

The average annual population Me = 656.2	Mark	Investments in fixed assets Me = 51,923	Mark
665.5	+	8112	−
663.2	+	13,500	−
675.7	+	12,584	−
666.3	+	17,861	−
661.4	+	21,858	−
664.2	+	42,466	−
668.8	+	37,143	−
672	+	44,203	−
671.3	+	55,174	+
656.2	+	51,923	+
648.8	−	72,291	+
638	−	80,386	+
639.9	−	81,019	+
634.2	−	86,348	+
627.4	−	88,541	+
635.9	−	75,437	+
626.6	−	88,363	+
621.1	−	79,820	+
665.1	+	80,251.5	+

Source Compiled by the authors

Next, we will build a correlation-regression model for further forecasting activities. Initially, it is necessary to identify an empirical formula that will correspond to the development trend of the source data. Table 3 presents the calculation results.

a, b are the coefficients of the optimal function.

For $\overline{x_s} = 665.3$ $y_s = 8112\frac{80,251.5-8112}{665.5-665.1} * (665.3 - 665.1) = 44, 181.75$.

The smallest difference is identified with empirical linear, demonstrative and hyperbolic functions. Let's build a trend using a linear function (Fig. 1).

The equation has the following form: y = 4887.3 × 5720.4. Next, we will conduct a regression analysis that establishes the relationship between the dependent (investment in fixed assets) and independent (average annual number of employees). According to the study of the model, we determine the regression statistics (Table 4).

The main purpose of the dispersion analysis is to analyze the significance of differences between averages in the analysis of variances (Table 5). The analysis of fixed investment indicator showed the following results (Table 5).

The final indicators calculated by the correlation-regression model and their analysis are presented in Table 6.

Table 3 Empirical formula

Type of empirical formula	$\overline{y_s}$	$\overline{x}_s$
$Y = a + b * x$	$\frac{y_1+y_n}{2} = \frac{8112+80251.5}{2} = 44, 181.75$	$\frac{x_1+x_n}{2} = \frac{665.5+665.1}{2} = 665.3$
$y = a^* b^x$ or $y = a^* e^{\beta - x}$ where $\beta = \ln b$	$\sqrt{y_1 * y_n} = \sqrt{8112 * 80251, 5} = 25514.705$	$\frac{x_1+x_n}{2} = \frac{665.5+665.1}{2} = 665.3$
$y = a_x^{\frac{b}{x}}$	$\frac{y_1+y_n}{2} = \frac{8112+80251.5}{2} = 44181.75$	$\frac{2x_1*x_n}{x_1+x_n} = \frac{2*665.5*665.1}{665.5+665.1} = 665.3$
$y = a^* \mathbf{x}^b$	$\sqrt{y_1 * y_n} = \sqrt{8112 * 80251, 5\$\$} = 25514.705$	$\sqrt{x_1 * x_n} = \sqrt{665, 5 * 665, 1} = 665.3$
$y = \frac{1}{a*x+b}$	$\frac{2*y_1*y_n}{y_1+y_n} = \frac{2*8112*80251.5}{8112+80251.5} = 14734.5945$	$\frac{x_1+x_n}{2} = \frac{665.5+665.1}{2} = 665.3$
$y = a^* \ln x + b$	$\frac{y_1+y_n}{2} = \frac{8112+80251.5}{2} = 44181.75$	$\sqrt{x_1 * x_n} = \sqrt{1 * 19} = 665.3$
$y = \frac{x}{a*x+b}$	$\frac{2*y_1*y_n}{y_1+y_n} = \frac{2*8112*80251.5}{8112+80251.5} = 14734.5945$	$\frac{2x_1*x_n}{x_1+x_n} = \frac{2*665.5*665.1}{665.5+665.1} = 665.3$

Source Compiled by the authors

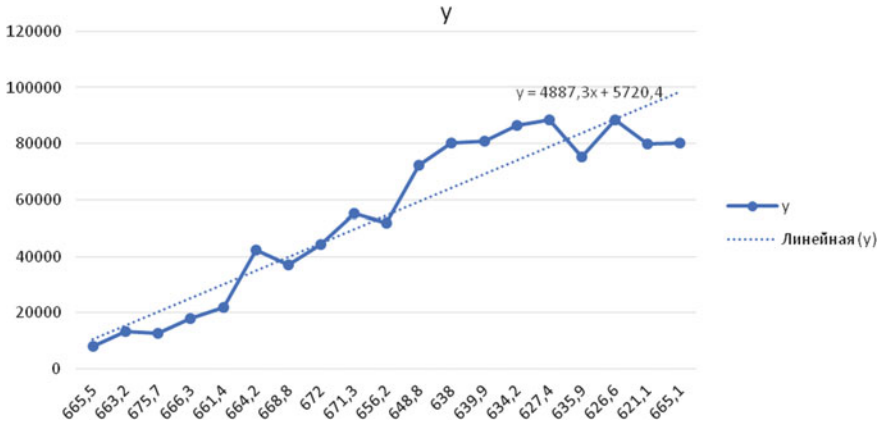

Fig. 1 Schedule of dependence of fixed investment on changes in annual average number of employed. *Source* Developed and compiled by the authors

The Darbin-Watson criterion is used to detect first-order autocorrelation by calculating the value of the Darbin-Watson criterion, $d = \frac{5364732549.699}{4925336409.250} = 1.089$, which is less than $d_1 = 1.28$ (Fig. 2), therefore, the selected model is selected correctly.

Table 4 Regression statistics

Regression statistics	
Multiple R	0.787174
R-squared	0.619643
Normalized R-squared	0.597269
Standard error	18,507.37
Observations	19

Source Compiled by the authors

Table 5 Dispersion analysis

Dispersion analysis					
	Df	SS	Ms	F	Significance F
Regression	1.0000	9,486,110,741.5066	9,486,110,741.5066	27.6948	0.0001
Balance	17.0000	5,822,888,486.9567	342,522,852.1739		
Total	18.0000	15,308,999,228.4633			

Source Compiled by the authors

Table 6 Analysis results

	Coefficient	Standard error	t-statistic	P value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Y intersection	898,174.6	160,353.9	5.60	3.18	559,857.2	1,236,492	559,857.3	1,236,492
Variable × 1	− 1292.42	245.5	− 5.26	6.35	− 1810.5	− 774.276	− 1810.56	− 774.276

Source Compiled by the authors

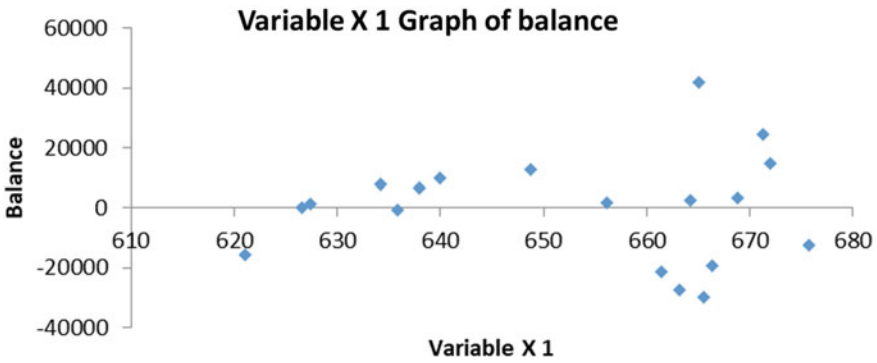

Fig. 2 Balance distribution chart. *Source* Developed and compiled by the authors

It should be noted that the calculated values of the correlation coefficients confirmed that the series are statistically dependent, and it is impossible to state the absence of autocorrelation. Based on the results of constructing the correlation-regression model we obtain the following linear function: $y = 4887.3x + 5720.4$. The analysis of time series showed that the average annual number of employees in the period 2000–2018 has a slight downward trend.

In the rating of investment attractiveness in 2019 Yaroslavl region ranks 17th among regions of the Russian Federation and belongs to the category of subjects with reduced investment potential with moderate investment risk. Industrial ecosystems of the region provide a low unemployment rate (0.8% as of 2019) and 73% of investment flow to the region.

5 Conclusion

According to studies, it was found that the key factors in the growth of the economic and investment attractiveness of the region are effective administration, social security of citizens, developed transport system, and educational environment. A high level of human capital influences the creation of a favorable business environment and is the basis for the development of ecosystems, including industrial ones.

Ecosystem approach allows optimizing the implementation of priority strategic directions, both at the level of individual industrial systems and the program of innovative development of human capital at the regional level. The results of the study can be used by managers and specialists of executive authorities in solving organizational and economic problems associated with the need to increase the investment attractiveness of the regions.

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On Regional Infrastructure of State Support for the Development of Smart Technology: Case of the Krasnoyarsk Territory

Irina A. Panteleeva, Vladimir I. Byvshev, Kristina V. Parfentieva, and Vadim G. Demin

Abstract The paper aims to develop proposals for the formation of an effective infrastructure of state support for the development of smart technology (based on the analysis of the innovation infrastructure of the Krasnoyarsk Territory). The authors analyze the role of the innovation infrastructure of the Krasnoyarsk Territory in supporting smart technology based on the concepts of "triple" and "quadruple" helices of innovation activity. The authors note the contradiction between the high interest of regional authorities in developing this sphere and the small number and insufficient quality of scientific projects in the relevant priority areas. The proposed steps to resolve this contradiction are based on the provisions of the concept of smart specialization of regions. In the Krasnoyarsk Territory, there are functioning basic elements of innovation infrastructure, an established regulatory framework, and adequate support measures for the development of smart technology. Based on the analysis of the elements of innovation infrastructure of the Krasnoyarsk Territory, the authors reveal several problems hindering the development of smart technology, including (1) the lack of qualified personnel, (2) insufficient level of interaction between the elements of innovation infrastructure of the Krasnoyarsk Territory, and (3) the lack of a systematic approach from the stakeholders. The authors propose several steps to solve these problems: (1) creation of an integrated system for the development of smart technology; (2) creation of a unified model of interaction between all elements of the innovation infrastructure; (3) development of a system of measures to attract highly qualified personnel in the field of smart technology

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to the Krasnoyarsk Territory; (4) targeted fundraising projects; (5) inter-regional comparisons in forming regional priorities based on the model of smart specialization.

Keywords Smart technology · Regional infrastructure to support smart technology · Innovation infrastructure · Triple helix · State support for science and innovation in the krasnoyarsk territory · Science foundation · Support infrastructure

JEL Code O310

1 Introduction

The second and third decades of the twenty-first century are the era of digitalization and smart technology—smartwatches, cars, traffic lights, houses, and even entire cities are not the subjects of description by science fictionists but an objective reality. Smart technology allows for efficient consumption of resources and has a noticeable impact on the development of society. The capabilities of smart technology and smart devices are now available to almost everyone. The availability of this technology is increasing, and its performance and functionality are growing year by year. Smart technology changes our lives and enables society to make its "intelligent transformation" (Melyancev 2017).

Despite such a dramatic breakthrough in this field and the widespread use of smart technology, society does not fully understand its nature and essence. The basis of social development is information and the process of producing new knowledge. As humankind develops, the amount of information and new knowledge acquired is constantly increasing, creating the need to store, process, and implement it in practice (Yakovlev 2016). It was for the processing and practical use of accumulated information that smart technology was created. Smart technology is a general name for modern high technology, with a high level of internal self-organization and a large number of feedbacks, providing a normal, rhythmic life of the system using them (Worden Bullough Haywood 2003). The use of smart technology in the activities of most economic actors is an objective necessity. This suggests that smart technology should solve common global problems and be used in achieving the goals of regional socio-economic systems. Any smart technology is based on scientific principles and innovations, which means that it is necessary to develop a regional innovation infrastructure to develop and apply smart technology in the region.

2 Methodology

The research is based on the triple helix concept of innovation and developing its concept of quadruple helix of innovation, as well as methods of structural–functional,

economic-statistical analysis, etc. The proposed solutions are based on the provisions of the concept of smart specialization of regions.

3 Results

Current foreign scientific thought sees the object of its analysis not so much in the individual elements of the innovation infrastructure at the regional level but rather considers their role in interaction with other regional subjects of the innovative scientific sphere (Dabinett 2014). Foreign researchers emphasize that it is at the regional and local level that decisions concerning the formation of innovation policy, development of innovative technologies, and creation and functioning of innovative infrastructure should be made since such decisions are key to the further existence of these regions or municipalities (Dabinett 2014).

In this regard, most scholars consider the triple helix concept of innovation, proposed by H. Etzkowitz and L. Leydesdorff (Etzkowitz 2002), as the main methodological tool for analyzing innovation activity in the regions. This concept represents the mechanism of interaction between regional and local institutions of science, government, and business in the production and commercialization of scientific, technical, and innovative developments (Etzkowitz 2002; Leydesdorff 2000; Phillips et al. 2014). Researchers note both the positive aspects of such a model of interaction and specific difficulties associated with the potential threat of closing the innovation sphere within itself, offering to the addressee of these innovations only a passive role. In particular, Carayannis and Grigoroudis (2016), as well as Campbell (2010), consider the participation of only three groups of designated actors to be insufficient, supplementing the triple helix with a fourth component—civil society/general public and media/mass media, initiating the innovation process and giving feedback. Thus, the quadruple helix represents the collective interaction and technology transfer between four subsystems: education and science, economy, politics, and civil society. It is precisely the fourth subsystem—civil society and the media—that acts as the core of the entire system, acting as "consumers, co-developers, and co-creators" (Carayannis and Grigoroudis 2016).

Along with studying the experience of regions and municipalities of European countries and the United States, it is interesting to analyze innovation clusters and individual elements of the innovation infrastructure.

Many Russian (Bogdanova 2018; Kashnikova 2013; Vajsman and Podshivalova 2015) and foreign (Benneworth et al. 2019; Hassink and Berg 2014) research is devoted to studying individual institutions of support of science and functioning of innovations on the regional or local level. Most of them consider the activities of such institutions in the context of regional policy and in connection with other development institutions.

The Krasnoyarsk Territory is one of the Russian regions with experience in creating innovative infrastructure, including for the development of smart technology. To date, the Krasnoyarsk Territory has created a legislative framework for

the infrastructure of state support of smart technology and has ensured the functioning of elements of such infrastructure (Zelenskaya and Sokolova 2012). In its activity, the infrastructure is based on the Law of the Krasnoyarsk Territory "On scientific, scientific-technical, and innovation activity in the Krasnoyarsk Territory" from December 22, 2011. The law is constantly updated; the last changes were made on November 21, 2019, in the edition of the Law of the Krasnoyarsk Territory No. 8–3339. According to the law mentioned above, the main directions of state support of scientific, scientific-technical, and innovation activity in the Krasnoyarsk Territory are as follows (Legislative Assembly of the Krasnoyarsk Territory 2011):

- Support and development of scientific and innovation activity in the Krasnoyarsk Territory;
- Organization and promotion of participation in events demonstrating the results of scientific, scientific-technical, and innovation activity in the Krasnoyarsk Territory;
- Development of international cooperation.

A separate section in the law is devoted to the innovative infrastructure of the Krasnoyarsk Territory created to develop innovative activities in the region and create a unified system of technology transfer and commercialization, as well as to contribute to an increase in the number of innovative products produced in the Krasnoyarsk Territory.

The law also defines the composition of the innovation infrastructure of the Krasnoyarsk Territory: business incubators, technology parks, industrial parks, industrial-technological parks, engineering centers, scientific organizations and educational organizations of higher education, funds to support scientific, technical, and innovation activities. The current composition and functionality of the elements of innovation infrastructure are shown in Fig. 1.

The existing innovation infrastructure on support and development of scientific and innovation activity is guided by the priorities of the state support of scientific, scientific and technical, and innovation activity in the Krasnoyarsk Territory formed by the Government of the Krasnoyarsk Territory and approved by the Resolution of the Legislative Assembly of the Krasnoyarsk Territory of July 7, 2009 No. 8-3635P. This list is constantly updated and includes priority areas focused on supporting the following smart technology:

1. Software technology;
2. Distributed computing technologies and systems;
3. Automation devices and systems for industrial and civil facilities;
4. Technology for navigation, communication, and control systems;
5. Methods and technical means of rehabilitation for people with disabilities;
6. Systems for remote diagnosis and consultation in medicine;
7. Environmental monitoring and forecasting technology;
8. Technology for the creation and effective use of energy-saving systems for the production, transportation, distribution, and consumption of water resources and electrical and thermal energy;

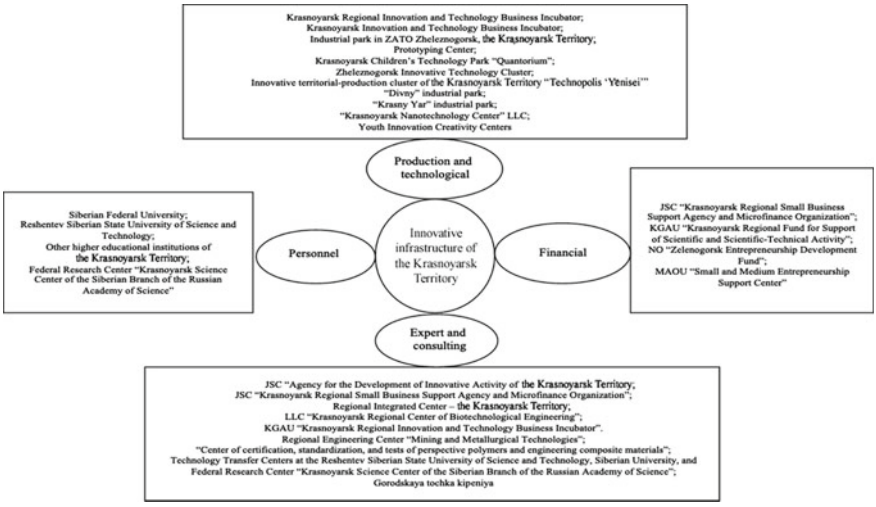

Fig. 1 Composition of the innovation infrastructure of the Krasnoyarsk Territory. *Source* Compiled by the authors

9. Intelligent systems and technologies for transport monitoring and control (Legislative Assembly of the Krasnoyarsk Territory 2009).

The priorities mentioned above are focused on the state support and development of smart technology in the Krasnoyarsk Territory. An element of the innovation infrastructure contributing to the development of smart systems at the stages from basic to applied research and subsequent technology creation is the regional state autonomous institution "Krasnoyarsk Regional Fund of Support of Scientific and Scientific-Technical Activity" (Foundation). The foundation operates through open competitions, which result in the financial support of a limited number of research projects. The winners of the competition sign an agreement on the order of target financing. This agreement is the basis for the further implementation of the project. From 2016–2018, the foundation held three types of competitions to support applied technologies:

- Contest of scientific and technical research, developments, innovative programs, and projects to ensure competitive advantages of the economy of the Krasnoyarsk Territory;
- Contest of scientific and technical projects aimed at the cooperation of institutions and organizations of the scientific and educational complex of the Krasnoyarsk Territory by order of industrial enterprises;
- Contest of social and humanitarian research, developments, and innovations aimed at improving the quality of life of the population of the Krasnoyarsk Territory.

The foundation selected projects from among the proposals of applicants, which included proposals for the topic of the project, the terms of reference, and the amount

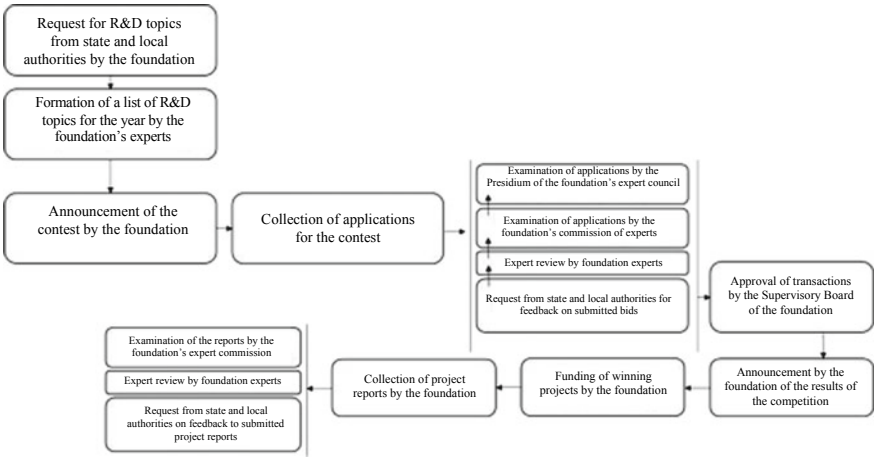

Fig. 2 Contest model. *Source* Compiled by the authors

of funding. The projects underwent the procedure of coordination with the state authorities of the Krasnoyarsk Territory and local authorities and industrial and science-intensive enterprises interested in the results. The participants provided co-financing of the project in the amount of 50% to 100% of the requested target funding, depending on the competition, both from grant applicants and businesses.

Since 2019, due to the need to concentrate the resources of the foundation and to improve the mechanisms of support for applied research, scientific and technical activities, and experimental development, the competitive selection is made through a single ompetition of projects of applied scientific and technical and socio-humanitarian research and experimental development aimed at creating products and technologies to ensure competitive advantages of the Krasnoyarsk Territory (Fig. 2).

The competition is based on the model of flexible co-financing from the participant and interested business entities. The peculiarity of the contest is that it is held on topics collected from state and local authorities within the priority areas of the Krasnoyarsk Territory. Once the list of competition topics is formed, the foundation collects applications for the competition in accordance with the specified list of topics. It is worth highlighting topics related to smart technology in the list of topics for the 2020 competition:

1. Applied research and experimental developments aimed at creating innovative industrial products with high added value in the field of energy-saving technologies that meet the requirements of industrial safety and electromagnetic compatibility;
2. Exploring the impact of digital technologies on labor productivity in the manufacturing sector of the Krasnoyarsk Territory;
3. Development of neural networks for predicting lethal outcome in the conservative management of patients with hemorrhagic stroke;

4. Creation of a virtual advisory and training service on the Internet for families with children with developmental disabilities;
5. Creation of a modern model of interdepartmental interaction to identify persons over 65 years of age living in rural areas, who need to be delivered to medical organizations; the formation and provision of an optimal delivery schedule;
6. Design and creation of a web-portal of geospatial data of lease areas in the Krasnoyarsk Territory;
7. Creation of an automated software package for drawing up forest pathological inspection reports;
8. Scientific and technical research and development aimed at improving the quality of passenger and luggage transportation by public transport.

The vast number of topics covering smart technology issues shows the strong interest of the government in them.

Additionally, there is a demand for smart technology from regional businesses and federal elements of the innovation infrastructure. Within the cooperation with the Russian Foundation for Basic Research, the Science Foundation of the Krasnoyarsk Territory is a pilot site for testing new models of competitions held by the Russian Foundation for Basic Research in the Russian regions. This positive trend was formed in view of the long and successful cooperation between the government of the Krasnoyarsk Territory and the Russian Foundation for Basic Research on supporting scientific research focused on problems of high technology. The first "Yenisei" Agreement on joint support of scientific projects was concluded in 2003. Since 2009, the Krasnoyarsk Territory is the operator of the regional competitions of the Russian Foundation for Basic Research.

In 2016, considering the effectiveness of targeted funding of scientific research, the total budget of joint regional competitions of the Krasnoyarsk Territory and the Russian Foundation for Basic Research was increased up to 180 million rubles; their range was also expanded. These measures are taken to develop scientific and scientific-technical research to maintain the competitiveness of the industry and national security of the Russian Federation and the Krasnoyarsk Territory. In order to meet the needs of business in solving scientific and technological problems (Fig. 3), the organizers formed a list of interdisciplinary thematic areas based on the interest of organizations participating in the integrated investment project "Yenisei Siberia" (Government of the Russian Federation 2019). This list declared the following priorities on smart technology:

1. Methods and models of intelligent analysis of incomplete data for creating management and decision support systems in technical, biological, and social fields;
2. Models and methods for optimal clustering in high-dimensional network structures;
3. Research and development of methods for remote analysis of round timber with the creation of a hardware and software complex of its accounting and control.

Despite the abundance of priority directions and topics, readiness of innovation infrastructure to support projects in smart technology, and the demand for smart

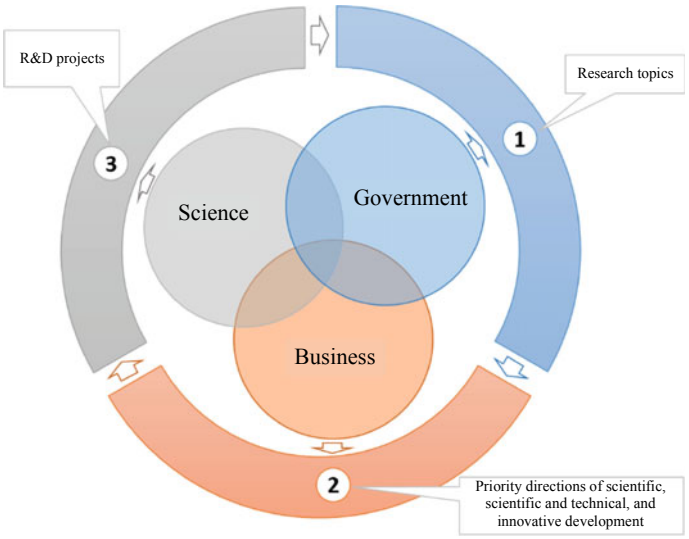

Fig. 3 Scheme of the interaction of elements of the innovation infrastructure within the triple helix concept of innovation. *Source* Compiled by the authors

technology from regional authorities and businesses, we do not see a large number of projects in this area. Over the past five years, the foundation has supported only several projects related to smart technology:

1. "Methodological approaches to forming the concept of the project "Smart City" in the context of trends in the digital economy (on the example of Krasnoyarsk)." The project is particularly relevant since the Krasnoyarsk Territory has launched the project of digitalization of urban economy "Smart City" within the framework of the national program "Digital Economy" and the national project "Housing and Urban Environment." The project makes several proposals on creating intelligent urban systems that optimize infrastructure and services, make informed decisions, and expand the range of public services in urban space (Dvinsky et al. 2017).
2. "NeyroDom" portal teleservicing neurorehabilitation. The project offers the use of computer and telecommunication technologies for the effective recovery of patients with neurological deficits due to preexisting conditions (multiple sclerosis, Parkinson's disease, and others) or stroke, craniocerebral and spinal injury (Ivanilova et al. 2019).
3. "Development of technology for creating intelligent information systems for object-oriented monitoring of territories based on remote sensing data." The study is interdisciplinary in nature, which is determined by the synthesis of knowledge in the field of building intelligent information systems, human–machine interaction, remote sensing, geoinformatics, as well as applied subject areas, within which the properties and behavior of the monitoring object are

studied. Nowadays, the project's results are applied in the activities of the security services of major industrial enterprises and fields in the Krasnoyarsk Territory (Maglinets et al. 2018).

4. "Development of fundamental scientific and technical foundations of methods and means to find coordinates of personnel in underground workings in case of rockfall." The intelligent security system is a hardware and software complex allowing to determine the coordinates of workers and heavy equipment in real-time with an accuracy of 10 cm in the underground mine workings.

We can single out several possible reasons for the small number of implemented projects in the field of smart technology in the Krasnoyarsk Territory:

- Shortage of qualified personnel capable of solving the tasks in the field of smart technology;
- Absence of a sustainable connection between the elements of the region's innovation infrastructure;
- Lack of a systematic approach on the part of stakeholders in the formation of demand for smart technology;
- Insufficient funding for creating world-class achievements.

The shortage of qualified personnel capable of solving problems in the field of smart technology is caused by brain drain and reduced attractiveness of the scientific sphere, which indicates the lack of development of the personnel component of the innovation infrastructure of the Krasnoyarsk Territory. An important indicator characterizing the state of human resources, in general, is the number of researchers, which decreased from 2012 to 2018 by 6.8% of the number of personnel engaged in research and development, while the number of those employed increased by 5.5%. The number of graduate students decreased by 24.2% and the number of doctoral students—by 67.3%. Additionally, it should be noted that scholars working in academic science usually do not see themselves as innovators working on the commercialization of the results of scientific activity and contributing to the transfer of technology. Scholars are characterized by a high degree of distrust to the business community. In turn, representatives of innovative enterprises, primarily business people, often do not have the necessary scientific potential to develop smart technology on their own.

With a generally sufficient number of elements of innovation infrastructure in the Krasnoyarsk Territory, there is an insufficient level of interconnection between them. The elements work in isolation, each in the performance of its activities, and without a common link between them. Supported projects are not transferred from one element of the infrastructure to another. Thus, there is no chain of technology transfer. There is also a lack of a common system for monitoring projects supported by different elements of the infrastructure and different administrative subordination of the elements: some of them are supervised by the Ministry of Economy and Regional Development of the Krasnoyarsk Territory, the other part is supported by the Ministry of Education of the Krasnoyarsk Territory.

The lack of a systematic approach on the part of stakeholders in the formation of demand for smart technology is that the formed demand for smart technology is a single point. It aims to solve one specific problem, rather than a complex of problems with a consistent transition from process to process, for which a unified solution based on smart technology is suitable.

As for insufficient funding, we should indicate that public and private partnerships in the region are promoted not too actively. Large enterprises (defense and old industry) do not have the right to solve strategic issues at the regional level. That is why such cooperation is most successful with representatives of small and medium-sized enterprises geared towards creating knowledge-intensive products.

4 Conclusion

Based on the conducted point-by-point analysis of the elements of the regional innovation infrastructure and the normative and legal base of the Krasnoyarsk Territory, defining priority directions for supporting scientific research in the region, the authors identified the following key problems impeding the development of smart technology in the region:

- Lack of qualified personnel;
- Insufficient interaction between the elements of the innovation infrastructure of the region;
- Lack of systematic approach from the stakeholders;
- Insufficient volume of financing.

Possible solutions to the above problems are as follows:

1. Appeal to the concept of smart specialization—the use of tacit knowledge and local competencies to select development priorities that provide differentiation and a unique market niche for regional innovation (Golova and Suhovej 2019);
2. State development of a unified, comprehensive system for the development or introduction of smart technology, taking into account the concept of smart specialization;
3. Development of a unified model of interaction between all elements of the innovation infrastructure to provide a continuous chain from the idea to the implementation of the project;
4. Development of a set of measures to attract and retain highly qualified personnel in the field of smart technology;
5. Identification of possible sources of funding for projects to develop and implement smart technology;
6. The cluster of engineering and biopharmaceuticals in the Loire Valley (France), as well as the “Intelligent” and efficient production of cheese in the rural region of Extremadura (Spain), can be used as examples of successful experience.

It is worth noting that smart technology in Russia need effective government support, which can be provided by elements of the innovation infrastructure if they are properly configured and functioning. This requires a structured and result-oriented dialogue between stakeholders—business, government, society, and science (Popkova et al. 2018). The discussion should focus on a new, sustainable, global, and socially oriented policy for research on smart cities, smart regions, and smart clusters that will ensure the collinearity of the vectors of developing smart technology in Russia (Visvizi et al. 2018).

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Analysis of Methods for Forecasting the Development of Innovative Processes in the Regions

Shamil I. Nigmatullin

Abstract The study of the methodology for forecasting the development of innovative processes in the regional economy is the most discouraging topic, since the economic well-being of the participants in the innovation process and the regions, as well as the state as a whole, depends on the accuracy of forecasts of the future process of creating, introducing and disseminating innovations in economic systems. The article considers the prerequisites for the development of the methodology for forecasting innovative processes in the economy, which are based on the analysis of the current trends in the development of innovative processes in the constituent entities of the Russian Federation and the inconsistency of actual indicators with target (planned) ones. For the most part, forecasts form the basis for the scenario development of innovation in the regions and long-term innovative development programs of the region. The author of the article studied the features of forecasting the development of innovative processes in the regions, including the theoretical foundations of innovation and the implementation of the innovative process from the stage of generating a scientific idea to diffusion and transfer of innovations. An in-depth analysis of existing methods of forecasting socio-economic and innovative processes in the economy was carried out, on the basis of which the main advantages and disadvantages of methods for forecasting innovative processes were formulated. The need for further development of a structural mechanism for forecasting the development of innovative processes in the regions on the basis of the principles of unification of indicators for the development of innovative processes, standardization of the stages of implementation of innovative processes is justified. The reported study was funded by RFBR, project number 19-310-90037/19.

Keywords Innovation · Innovative processes · Innovative development · Forecasting methods · Forecasting · Intuitive-logical methods · Statistical methods · Mathematical methods · Innovative development programs · Region

JEL Codes C53 · O21 · O32

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1 Introduction

In innovation theory, one important aspect is the assessment of the impact of innovation as the final end result of all stages of the innovation process, from the generation of an idea to the creation of an innovation in the form of a specific technology or product and its spread in markets, to the economic situation of the region and its long-term development.

The innovative process of the region itself represents a mechanism that uses the accumulated potential of scientific and intellectual, personnel, financial, information and telecommunication resources, as well as organizational and infrastructure potential, the implementation of which allows creating innovations primarily for enterprises in the region, as well as ensuring the diffusion of innovations for other economic entities both Russia and foreign countries.

Most of scientists (Popkova 2012; Abramov et al. ; Leybert and Vanchukhina 2013), when studying trends of economic development focus the attention to need of the choice of an innovative way of development in the conditions of adverse macroeconomic factors for the purpose of search of new requirements and development of strategy of economic growth on the basis of innovations.

As shown by the Russian and foreign practice of predicting innovative processes, the most advanced in modern practice are specialized methods for predicting innovative processes, which are a symbiosis of all possible methods, including logical-intuitive, probabilistic-statistical, mathematical, simulation modeling methods, expert and others.

In the presented scientific studies, the author analyzes existing foreign and Russian methodological approaches to predicting the development of innovative processes in the regions.

This article is based on numerous published works on the problem posed, in particular, on the work of Gafarova et al. (Gafarova et al. 2014).

The authors also used the materials from Order of the Ministry of Economic Development of the Russian Federation dated 30.06.2016 No. 417 “On Approval of Methodological Recommendations for the Development and Adjustment of the Long-Term Forecast of the Socio-Economic Development of the Russian Federation” (Order of the Ministry of Economic Development of the Russian Federation dated 30.02016 No. 417 On Approval of Methodological Recommendations for the Development and Adjustment of the Long-Term Forecast of the Socio-Economic Development of the Russian Federation2020) and Order of the Ministry of Economic Development of the Russian Federation dated 23.03.2017 No. 132 “On Approval of Methodological Recommendations for the Development and Adjustment of the Social and Economic Development Strategy of a Subject of the Russian Federation and the Action Plan for its Implementation” ((Order of the Ministry of Economic Development of the Russian Federation dated 30.02016 No. 417 On Approval of Methodological Recommendations for the Development and Adjustment of the Long-Term Forecast of the Socio-Economic Development of the Russian Federation2020) in this article.

2 Materials and Methods

Focusing on the evolution of innovative process models (Volostnikov 2009) based on accelerating the time lag of the innovation life cycle by not reducing the fundamental stages of the innovation process (basic research—the emergence of ideas, applied research, development, commercialization of innovations, introduction into industrial production) and strategic integration and networking among innovation actors, which in turn enables parallel action in several areas aimed at creating innovation. However, when predicting the development of the innovation process, it is important to understand how long it will take not only the innovation lag, that is, from the beginning of the generation of the idea to the formation of the market for innovative products, but the process of diffusion of innovation, that is, its dissemination among consumers and assessment of the effectiveness of investing investor capital in the creation of innovation.

Considering the long term of implementation of innovative process, there is a need of forecasting of indicators of his development both at the microlevel, and at the level of the region.

Creation of forecasts of development of innovative processes allows to define the scenario of further social and economic and innovative development of the region, to develop the program of innovative development of the region including events for acceleration of stages of innovative process to install key indicators of development of innovative processes and their threshold values and also on the basis of these indicators to organize a system of monitoring and monitoring on achievement of strategic objectives of development of innovative processes in the region.

In the scientific environment the issue of algorithmization and methodology of creation of projections of development of innovative processes in the region is actively discussed with use of a certain set of indicators and mathematical tools.

Founders of development of methodology of forecasting of development of innovative processes in economy is the group of scientists (Kondratyev et al. 2002), which in the scientific work "Big Cycles of an Environment and Theory of Anticipation" (define the concept "forecast" and put forward the theory of economic regularities on the basis of forecasting methodology.

As N.D. Kondratyev notes, methodologies of forecasting theoretical states of the economy as sciences are the cornerstone are theories of a statics and dynamics. The first theory is based on a research "structures and interactions of elements of an economic system in the conditions of balance and stability" (Kondratyev et al. 2002). As a rule, the modern methodology of forecasting is based on statistical regularities which developed in the last periods or in a retrospective taking into account the revealed factors which can influence future trends of their development.

The theory of a statics doesn't consider such economic event as crisis which breaks economic balance therefore there is the second theory of forecasting as dynamics. This theory studies "economic events in the course of change of elements and their ratios" (Kondratyev et al. 2002) and on the basis of them regularities are defined. As showed long researches of the above-stated scientists, forecasting is based on

accounting of wavy regularities of dynamics of economic events and processes. Otherwise, they call cyclic and dynamic forecasting.

The main feature and positive aspect of the theory of dynamics is an anticipation "transition from a phase to a phase of a cycle and from a cycle to the following cycle" (Kondratyev et al. 2002) and future crisis in result of recurrence of an economic system. At the same time at creation of the forecast there is a possibility of accounting of unaccounted factors which in the future can negatively influence economy of the region and country.

It is necessary to recognize the scientific component of the theory of N.D. Kondratyeva, who formulated the principles of forecasting, the short characteristic of which is presented in Table 1.

In his theory, he identifies three types of forecasting:

(1) An irregular type is a prediction that does not have a clearly expressed pattern. The methodology for its construction is based on a method of directly constructing a forecast based on the probability of the occurrence or non-occurrence of the expected event, or indirectly constructing a forecast that takes into account factors that can affect the positive outcome of events.
(2) A cyclical type is such a prediction that is based on the anticipation of cycles and crises, that is, events that have repeatability or cyclicity. The prediction methodology is based on the method of direct anticipation by directly constructing a

Table 1 Principles of forecasting in the theory of N.D. Kondratyeva

Principle name	Brief description
The principle of scientificity	When constructing a forecast, three important scientific aspects must be taken into account: forecasting events on data from the experience of completed events; forecasting of events that are not given as they have not occurred; forecasting should be based on a residual level of judgment on the probability of event outcome
Principle of accuracy and reliability of forecast	The accuracy and reliability of the forecast depends on the tasks that are set for the forecast and on the characteristics of the predicted area. The more complex the tasks and the further the time of the predicted event, the lower the accuracy and low reliability of the forecast. It is necessary to set the optimal number of tasks before the forecast so that it can be adjusted and clarified as a result of random and risky events in the economy
Principle of accounting for causal relationship or preconditions of forecast	A forecast can be constructed if there is a causal relationship and a relationship between elementary phenomena that affect the predicted event and the pattern of their course

Source Compiled by the author

curve describing the wave-like nature of the expected event, or an indirect construction based on the determination of the dependence of cyclic series over time.

(3) Forecasting of general patterns and trends in the economy.

Modern scientists engaged in the study of innovative processes in the economy are considering various methods for predicting indicators of the development of innovative processes.

Therefore, (Morozov 2014) notes that long-term forecasts of innovation in the region should be based on the theory of cyclicity proposed by N.D. Kondratyev, as well as take into account world and all-Russian trends in the economy and in the development of "technological frameworks and cycles of generations of technology and technology."

Regarding the innovative development of the region, there is a need for a retrospective analysis of its existing rating in the interregional division of labor, resources, socio-demographic and natural-environmental assessment, assessment of innovative potential and factors that hinder the development of innovative processes in the region.

In addition, when predicting innovative processes in the region, it is also necessary to take into account the level of introduction of innovations and the scale of their spread among those industry enterprises that create them and are the locomotive of the regional economy, as well as among other enterprises, for example, small and medium-sized businesses, which are also the driver of diffusion and transfer of innovations.

A group of scientists (Krasnova and Plotnikova 2014) considered the main stages of forecasting the development of innovative processes in the region:

(1) identification and grouping of factors stimulating the development of innovative processes;
(2) assessment of structural elements determining the innovative potential of the region;
(3) identification of key indicators of innovation processes development efficiency;
(4) development, compilation of a model of predictive development of innovative processes in the region and verification of adequacy of the obtained predictive parameters.

Based on the results of the literary review on the problem of the methodology for forecasting indicators of the development of innovative processes in the economy, approaches and methods of forecasting were systematized.

The classical approaches formulated by economists are research and targeted. They often rely on retrospective data and established targets. The comparative characteristics of these approaches are shown in Table 2.

The second campaign proposed by Malyshev (2012) is based on the variability of policy, software-targeted and indicative forecasting methods. The policy method is characterized by the use of indicators and their planned forecasting using models of the balance of the national economy and optimization methods.

Table 2 Comparative analysis of the research and targeted approach

Object	Forecasting methods	
	Research	Target
Concept in forecasting	Indicative forecasting	Develop different forecast options and choose the optimal
Forecasting Technique	Building multi-factor models using mathematical tools	Construction of forecasts based on studied dynamics of indicators and application of formalized forecasting methods
Horizons for forecasting	short-, medium- and long-term projections taking into account socio-economic development	Long-term forecasting based on risk assessment affecting targeted socio-economic development
Ability to match another forecast	Making different projections based on coordination and co-ordination of forecasts	Individual forecasting based on global forecast consistency

Source Compiled by the author

The program-targeted approach uses a legal basis, that is, the priority is the development of target guidelines in programs for the socio-economic development of regions based on correlation-regression analysis and expert assessments.

The indicative method includes the method of expert assessments, the method of constructing correlation and regression, the cognitive method and the method of simulation modeling and is exclusively advisory in nature.

Given that the innovation process in the region is an economic process accompanied by the dynamics of macroeconomic indicators, such as gross regional product, investment in fixed assets, labor productivity, the number of high-performance jobs and others, the basis for forecasting is the methods for making socio-economic and technological forecasts. An analysis of existing methods for forecasting socio-economic and innovative processes is presented in Table 3.

3 Results

Based on the results of the analysis of methods for forecasting socio-economic and innovative processes, it can be concluded that intuitive-logical methods are not devoid of shortcomings due to the use of the possibility of constructing forecasts based on the opinions of experts, analysts, specialists involved in forecasting and studying laws.

Trend extrapolation methods are mostly based on the construction of short-term forecasts and do not take into account the long-term trend of the development of the innovation process in view of the strong variability in the forecast indicators generated by the diffusion of innovation.

Table 3 Analysis of existing methods of forecasting socio-economic and innovative processes

Forecasting method	Brief description	Advantages of the method	Disadvantages of the method
Intuitive logical methods			
Delphi method	It involves a multi-level survey drawn up by experts	The basis of forecasting is the collective conclusions of high-level specialists	No combination of formalized, scripted and expert approach to forecasting. Not enough to use expert method only
Scripting method	Involves the development of different scenarios based on the estimation of the hypothesis of the probability of the expected event	It is used in cases when the process being studied cannot be formalized It is used to predict complex systems over the long term	-
Method of regulatory and survey forecasting			
SWOT-analysis	It involves an assessment of the impact, potential threats and future opportunities on the dynamics of the process under study	Comprehensive analysis of the process under study in terms of macro- and micro-level	It does not make it possible to make a forecast development of the studied process, but only to outline its paths, additional development of a plan for the forecast scenario development of the process with the involvement of other methods is required
PEST-analysis	It involves an assessment of political, economic, social and technological factors on trends in the process	Additional analytical tools to support forecasts	the same drawback as SWOT analysis
Method of analysis of 5 forces of competition	It involves an assessment of the competitiveness of the process under study	It involves an assessment of the competitiveness of the process under study	The same drawback as SWOT analysis

(continued)

Table 3 (continued)

Forecasting method	Brief description	Advantages of the method	Disadvantages of the method
GAP-analysis	It involves an analysis of gaps or inconsistencies between actual achieved and projected/planned process indicators	Additional analytical tools for forecasting process development	the same drawback as SWOT analysis
BCG matrix	Portfolio analysis toolkit and is based on prioritizing process development using a matrix approach	Additional analytical tools for developing a process development strategy	The same drawback as SWOT analysis
McKinsey matrix	Portfolio analysis toolkit and is based on drawing up a matrix taking into account the specified criteria and their weights, scoring the specified parameters of the process development strategy	Additional analytical tools for developing a process development strategy	The same drawback as SWOT analysis
Trend extrapolation methods			
Moving average method	Method of smoothing the time series and is based on mutual cancellation of deviations of random variables from the average in the selected time interval	Broad application for short-term forecasting	Not applicable to innovation processes generated by innovation due to strong variability in predictive performance
Exponential smoothing method	Time series smoothing method and is based on constructing a forecast estimate one time lag forward	Wide application for medium-term forecasts, easy calculations	The same disadvantage as the moving average method, the difficulty of selecting the smoothing parameter value and the initial value of the predicted indicator

(continued)

Table 3 (continued)

Forecasting method	Brief description	Advantages of the method	Disadvantages of the method
Least-squares method	Assumes the determination of the minimum sum between the quadratic deviations of observed and calculated values based on the regression equation	More accurate prediction method compared to time series smoothing methods	The same drawback as the moving average method, the difficulty of fitting a regression equation that accurately describes the process being studied
Specialized methods			
Software-target method	Planning based on setting the objective of the plan, developing a way to achieve the objective (programme) and assessing resources to achieve the objective. The forecast is the development program	Allows not only to predict the desired goal and to track the emerging situation, but also to influence the ongoing processes in a timely manner. This method relates more to software management	Lack of standardized, regulatory procedures and uniform methodological provisions to develop targeted programmes for developing processes in the regions and assess their cost-effectiveness
Forsyth method	A planning tool based on the involvement of a large number of experts in various fields and the use of various formalized and informal methods (intuitive logical, statistical, mathematical, probabilistic, expert)	It is used to predict the long-term prospects of science, technology, society and the economy and takes into account the consistency of views of all agents participating in the forsite session, ensures the reliability and accuracy of the made forecasts	Quite complex and labour-intensive in terms of organizational and financial aspects
Road map method	It is based on the combination of the program-target method and the construction of indicative forecasts and provides a step-by-step outline of the scenario for achieving the goal with the involvement of a large number of experts	It allows you to manage the process to achieve forecast estimates	The same drawback as the Forsyth method

Source Compiled by the author

Reference should also be made to the Russian legal documentation defining methodological recommendations for the development of forecasts, both at the federal level and at the level of the constituent entities of the Russian Federation. Thus, in the methodological guidelines on the development and adjustment of the long-term forecast of the socio-economic development of the Russian Federation, when constructing forecasts of the long-term development of socio-economic indicators, it is recommended to use three groups of methods: expert methods, methods of feasibility studies and balance calculations and methods of economic and mathematical modeling. The first group of methods includes: the Delphi method, individual position and collective choice (Forsyth method). The second group includes technical and economic calculations of forecast estimates of factors and conditions taking into account megatrends and world scenario forecasts, including the calculation of norms and norms of used resources, parameters and indicators, as well as calculations based on the establishment of a balance sheet relationship between macroeconomic indicators.

The third group includes mathematical methods for constructing scenario forecasts and probable alternative outcomes for the development of predicted indicators.

4 Conclusion

Therefore, the results of the research conducted in the field of methodology for forecasting the development of innovative processes in the regions make it possible to formulate the shortcomings of the existing approach to forecasting. It is difficult to use probabilistic and statistical methods to predict the development of innovative processes in the regions due to the lack of a full-fledged opportunity to form a homogeneous collection of retrospective data and the presence of nonlinear dependence of indicators—factors that influence the development of innovative processes. Therefore, it is necessary to develop a universal mechanism for forecasting indicators of the development of innovative processes in the regions, which will take into account not only the scenario approach of possible outcomes of the development of innovation and not its basis, the choice of the most realistic, but also the variant of modeling the implementation of the innovation process itself in the region.

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Rating of Travel Companies in Russian Regions as a Tool for Sustainable Development

Ludmila I. Chernikova, Tatiana A. Slepneva, Elena N. Egorova, and Anna A. Silaeva

Abstract The purpose of this research is to develop a regional rating of the economic efficiency of the industry based on DEA-analysis and compare the results with the regional rating of tourism development. The scientific novelty of this study is that in the work the potential of regional development is assessed through the effectiveness of travel firms in the context of regions. The empirical base of the study included 2074 companies, the financial statements of the companies were collected over 10 years, from 2007 to 2017, the number of records 20,740. In this research, the DEA analysis includes input variables: liquidity ratio, profitability of assets, number of employees in travel companies. According to the results of the study, it was revealed that the efficiency of travel companies in each region does not have strong deviations from the national average. In the North-West, Volga, Far Eastern and Southern Federal Districts, there is an almost equal indicator of the efficiency of travel companies, which confirms that on average in Russia the tourism industry works effectively, but does not reach extremely high values. As a result, the combined rating of the efficiency of travel companies, taking into account the rating of the profitability of assets of companies, also revealed the general trend of a number of regions with an equal level of economic efficiency of the tourism industry.

Keywords Tourism · Modelling · Companies · Regions · Efficiency of companies

JEL Codes Z32 · Z33 · Z30

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1 Introduction

The topic related to the assessment of the potential of tourism development is relevant for the regions, since their development in the tourist direction is assessed as ambiguous, since in most of them there are a number of problems and the main local directions of development are not defined. In regions, tourism has a special role, it can be an additional source of local budget funds, create additional jobs and thereby provide jobs. Moreover, as a result of the development of tourism, relations between states and between regions of the Russian Federation may strengthen (Bunakov et al. 2019). The purpose of this research is to develop a regional rating of the economic efficiency of the industry based on DEA-analysis and compare the results with the regional rating of tourism development. The scientific novelty of this study is that in the work the potential of regional development is assessed through the effectiveness of travel firms in the context of regions.

The scientific and methodological basis of this study was determined by existing research and publications on the problem posed by such scientists and researchers as Kharitonova et al. (2018), Ponomareva et al. (2020), Bure et al. (2019), Ermolovskaya and Fedorova (2019), Makhluf (2019).

2 Methodology

The work uses two methods of research, this is DEA analysis and analysis of financial coefficients. The research methodology involves the following steps:

1. Building performance rating of travel companies based on DEA-analysis, BCC-output model.
2. Evaluation of the performance of travel companies based on the analysis of the profitability of companies' assets.
3. Construction of a combined rating of the efficiency of travel companies and its comparison with the rating of tourism development.

In this research, the DEA analysis includes input variables: liquidity ratio, profitability of assets, number of employees in travel companies. The variable at the exit is the profit of travel companies. A similar analysis was used in a number of studies in domestic and foreign literature. Vdovin K.E. conducted an assessment of the effectiveness of tourism services in Russia and foreign countries, based on the analysis, promising areas of medical services for foreign citizens were identified (Vdovin 2019). The methodology for applying DEA is described in more detail in the authors' study (Bure et al. 2019), the author in his research developed a two-stage algorithm consisting in conducting and modeling based on DEA and constructing clustering. As a result of the implementation of the first stage, indicators of effectiveness by time were obtained for each enterprise, then these indicators were used in the construction of clusters based on average and then analysis of each cluster

Table 1 Number of companies in the tourism industry

Federal districts	Number of companies	Cross section
Central	896	43.20
Northwest	315	15.19
Southern	165	7.96
North Caucasian	38	1.83
Volga	265	12.78
Ural	146	7.04
Siberian	170	8.20
Far East	79	3.81
Total	2074	100.00

Source Developed by the Author

was carried out. The DEA analysis was also used to assess the economy of a single-industry town in the research by Vazdaeva and Mitsel (2017), a similar model was used in this research and the DEA method was used to assess the technological efficiency of single-industry towns taking into account the development of small businesses. Industry aspects were also taken into account in the model. Authors Akerman et al. 2020 (2020), Afanasyev and Fedorova 2019 (2019) estimated the time trends of dynamic performance indicators and a comparative analysis of the investigated industries according to the combination of static and dynamic performance indicators. As for our research, the selection of financial ratios of companies is carried out in the context of the financial statements of enterprises: the balance sheet, income statement and statement of cash flow and independently calculated financial ratios. The selection of indicators was carried out from all financial ratios presented in these reports of organizations, according to their requirements, for introduction into the regression model. It should be noted that the results of the calculations do not have absolute correctness, due to uncertainty about the correct financial indicators provided and due to the fact that part of the data was obtained by calculation, based on data taken from the reports.

As a result, 2074 companies were selected, the financial statements of the companies were collected for 10 years, from 2007 to 2017, the number of records 20,740 (Table 1). The largest number of travel companies is registered in the Central Federal District (43.2%), 896 companies, this can be explained by the fact that the Central Federal District includes Moscow with a high level of tourist flows.

3 Results

The results of the DEA assessment are shown in Table 2.

Table 2 shows that the performance of travel companies in each region does not have strong deviations from the national average. In the North-West, Volga,

Table 2 Rating of travel companies based on DEA analysis by federal districts of Russia for 2017

Name of the federal district	DEA	Place in the ranking
Far Eastern Federal District	0.6149	4
Volga Federal District	0.6152	3
Northwest Federal District	0.6198	2
North Caucasus Federal District	0.6635	1
Siberian Federal District	0.6048	6
Ural Federal District	0.5979	7
Central Federal District	0.5413	8
Southern Federal District	0.6114	5
District average	0.6086	

Source Developed by the Author

Far Eastern and Southern Federal Districts, there is an almost equal indicator of the efficiency of travel companies, which confirms that on average in Russia the tourism industry works effectively, but does not reach extremely high values. The highest value of the indicator compared to other districts is characterized by the North Caucasus Federal District. The lowest value of the efficiency of travel companies belongs to the Central Federal District. This result is not obvious, it may be due to the fact that in the North Caucasus District there are a much smaller number of travel companies, while in the Central District there are the largest number of them, thus, a more effective work of a smaller number of companies affected the highest result. Detailed consideration of this aspect involves the construction of a rating of regions of the North Caucasus Federal District (Table 3).

Table 3 Rating of travel companies based on DEA-analysis by regions of the North Caucasus Federal District for 2017

Name of the federal district	DEA	Place in the ranking
Kabardino—Balkar Republic	0.7725	1
Karachay—Cherkess Republic	0.4615	5
Republic of Dagestan	0.4864	4
Republic of Ingushetia	0.3704	7
Republic of North Ossetia—Alania	0.4500	6
Stavropol Territory	0.7438	2
Chechen Republic	0.5278	3
District average	0.6635	

Source Developed by the Author

Based on the data obtained, in the Table 3 it is shown that the high efficiency of travel companies of the North Caucasus Federal District is associated with high indicators related to the regions: Kabardino-Balkarian Republic and Stavropol Territory. The next highest rating is the Chechen Republic, but the indicator characterizing the efficiency of the tourism industry is almost 30% lower than the second place in the rating. The weakest link in the North-Western District according to these characteristics is the Republic of Ingushetia, the efficiency indicator is 0.37 is 2 times less than the corresponding average in Russia.

In order to most objectively assess the efficiency of the tourism industry, it is necessary to take into account the rating of federal districts on the profitability of assets of travel companies (Table 4).

In the ranking presented in Table 4, the first place in terms of the efficiency of travel companies is taken by the Siberian Federal District, in which the profitability of assets amounted to 57.71%, the last place is the Southern Federal District with an asset profitability of 16.65%. This rating distinguishes from the previously built on the basis of DEA-analysis that there are significant differences in indicators. According to Table 4, the Southern and Siberian Federal Districts have extremely different positions, while according to Table 2, the Southern District takes 5th position and overtakes the Siberian Federal District by one line.

As a result of the differences between the rating based on DEA-analysis and the rating based on asset profitability, it was decided to build a single series. The total rating is based on the summation of the points of federal districts (previously

Table 4 Rating of travel companies based on profitability of assets by federal districts of Russia for 2017

Name of the federal district	Return on assets	Place in the ranking
Far Eastern Federal District	42.33	2
Volga Federal District	38.93	3
Northwest Federal District	29.86	4
North Caucasus Federal District	24.82	5
Siberian Federal District	57.71	1
Ural Federal District	23.93	6
Central Federal District	19.35	7
Southern Federal District	16.65	8
District average	31.70	

Source Developed by the Author

Table 5 Total performance rating of travel companies by districts based on results of DEA analysis and obtained values of profitability of assets

Name of the federal district	Performance rating
Far Eastern Federal District	6.00
Volga Federal District	6.00
Northwest Federal District	6.00
North Caucasus Federal District	6.00
Siberian Federal District	7.00
Ural Federal District	13.00
Central Federal District	15.00
Southern Federal District	13.00

Source Developed by the Author

indicated places in the rating), where a lower number of points means a higher amount of economic efficiency of companies.

The rating obtained in Table 5 once again confirms the equal level of efficiency of the tourism industry in several federal districts, however, their composition has changed, the smallest points (highest score) belong to the districts: Far Eastern, Volga, North-West and North Caucasus. The weakest in the ranking was the Central Federal District, as well as the Ural and Southern Federal Districts. Thus, the results obtained give an idea of the most developed districts in terms of the performance indicator of travel companies, but do not determine the difference in their situation.

4 Discussion

Further research is carried out on the basis of a comparison of the results obtained and the rating of tourism development in federal districts (Table 6).

In the ranking presented in Table 6, the Southern Federal District and Central are leading in terms of indicator, while in the performance rating these regions occupied the weakest positions. There is an inverse dependence of the indicators studied in the ratings in relation to the indicated federal districts. Feedback is observed in relation to the Far Eastern District—the leader of the combined efficiency rating, but having the lowest level of tourism development of 0.54, which is a small value in relation to the average for all districts. The following positions in the ranking in terms of the size of the tourism development index belong to the districts: Volga, North-West and North-Caucasus, which are the leaders in the aggregate performance rating. There is a relationship between the ratings in this family way, since the values of the tourism development index that characterize the listed districts are high. Therefore, the correlation between the studied ratings is observed in part, in particular for the three districts.

Table 6 Rating based on the Tourism Development Index for Federal Districts of Russia for 2017

Name of the federal district	Tourism development index	Place in the ranking
Far Eastern Federal District	0.54	8
Volga Federal District	1.99	3
Northwest Federal District	1.62	5
North Caucasus Federal District	1.77	4
Siberian Federal District	0.86	7
Ural Federal District	1.09	6
Central Federal District	2.06	2
Southern Federal District	2.10	1
District average	1.50	

Source Developed by the Author

5 Conclusion

According to the results of the DEA analysis, a rating of federal districts was built according to the criterion of economic efficiency of travel companies in their composition for 2017. The obtained values illustrated the approximate equality between the efficiency of the tourism industry in federal districts due to the proximity of all the obtained values to the average for all Russian tourist companies. However, as a result of the analysis of a separate district—North Caucasus, which is the leader in this rating, it was revealed that within the districts there are differences in the level of efficiency of travel companies.

The combined rating of the efficiency of travel companies, taking into account the rating of the profitability of assets of companies, also revealed the general trend of a number of regions with an equal level of economic efficiency of the tourism industry. Therefore, in order to obtain more specific values, a comparison was made between the total rating and the rating, which is based on the level of tourism development. As a result, it was concluded that the Volga, North Caucasus and North-West federal districts are characterized by high values of the tourism development index and the economic efficiency of travel companies in 2017. In relation to other districts, feedback is observed between the surveyed ratings.

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Correction to: Consumer Cooperation as a Driver of Sustainable Rural Development

Nadezhda A. Ovcharenko, Natalia A. Asanova, Saniyat Yu. Hut, Lydia N. Isachkova, and Elena V. Sidorchukova

Correction to:
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In the original version of the book, the following correction have been incorporated in Chapter "Consumer Cooperation as a Driver of Sustainable Rural Development": In Reference section, author name has been changed from "Vershitskaya AV" to "Vershitskiy AV" The chapter and book have been updated with the changes.

The updated version of this chapter can be found at https://doi.org/10.1007/978-3-030-77000-6_142

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