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ECONOMIC AND SOCIAL CHANGES: FACTS, TRENDS, FORECAST

A peer-reviewed scientific journal that covers issues of analysis and forecast of changes in the economy and social spheres in various countries, regions, and local territories.

The main purpose of the journal is to provide the scientific community and practitioners with an opportunity to publish socio-economic research findings, review different viewpoints on the topical issues of economic and social development, and participate in the discussion of these issues. The remit of the journal comprises development strategies of the territories, regional and sectoral economy, social development, budget revenues, streamlining expenditures, innovative economy, and economic theory.

Founder: Vologda Research Center of the Russian Academy of Sciences

Federal State Budgetary Institution of Science Vologda Research Center of the Russian Academy of Sciences (VolRC RAS) is the only unit of the Academy on the territory of the Vologda Oblast. The history of the Center started in 1990 from a Department of the Institute for Economic Studies of the Kola Science Centre of RAS on studying the problems of socio-economic development of the Vologda Oblast. Since then the Center has undergone manifold transformations. In 1993 it became an independent subdivision – the Vologda Scientific Coordinating Center of RAS. In 2009 it transformed into the Institute of Socio-Economic Development of Territories of RAS (ISEDT RAS).

In 2017 the socio-economic research was supplemented by agricultural issues. ISEDT RAS was joined by the Northwestern Dairy and Grassland Farming Research Institute, and was reorganized into the Vologda Research Center of the Russian Academy of Sciences.

In 2019 the Center continued expanding having launched the Laboratory of Bioeconomics and Sustainable Development within the framework of the national project "Science". The Laboratory is engaged in scientific research aimed at introducing biotechnologies into the practice of agriculture.

The VolRC RAS Director is Aleksandra A. Shabunova (Doctor of Economics). The Academic Leader of the Center is Vladimir A. Ilyin (RAS Corresponding Member, Doctor of Economics, Professor, Honored Worker of Science of the Russian Federation).

MAIN RESEARCH DIRECTIONS

In accordance with the Charter, the Vologda Research Center carries out fundamental, exploratory and applied research in the following fields:

- problems of economic growth, scientific basis of regional policy, sustainable development of territories and municipalities, and transformations of socio-economic space;
- regional integration into global economic and political processes, problems of economic security and competitiveness of territorial socio-economic systems;
- territorial characteristics of living standards and lifestyle, behavioral strategies and world view of different groups of the Russian society;
- development of regional socio-economic systems, implementation of new forms and methods concerning territorial organization of society and economy, development of territories' recreational area;
- socio-economic problems regarding scientific and innovative transformation activities of territories;
- elaboration of society's informatization problems, development of intellectual technologies in information territorial systems, science and education;
- development of scientifically based systems of dairy cattle breeding in the conditions of the North-Western region of Russia;
- development of new breeding methods, methods and programs for improving breeding work with cattle;
- development of scientifically based feed production systems, norms, rations and feeding systems for cattle in the conditions of the North-Western region of Russia;

- development of zonal technologies for the cultivation of agricultural crops;
- development of technologies for the creation, improvement and rational use of hayfields and pastures in the conditions of the North-Western region of Russia;
- development of technologies and technical means for agricultural production in the North-Western region of Russia;
- assessment of biodiversity in the North-Western region of Russia;
- development and implementation of biotechnologies in agricultural production;
- improvement of breeding methods and creation of new varieties of forage crops.

INTERNATIONAL TIES AND PROJECTS

VolRC RAS is actively developing its international activities. It is involved in joint international grant projects and regularly holds international conferences and workshops. The Center has Cooperation agreements and Memoranda of understanding with research organizations:

2007 – Cooperation agreement is signed with the Institute of Sociology of the National Academy of Sciences of Belarus , Center for Sociological and Marketing Investigations at the "International Institute of Humanities and Economics" (Belarus, 2008).

2008 – Memorandum of agreement is signed with Alexander's Institute at the Helsinki University (Finland, 2008).

2009 – Cooperation agreement is signed with Center for System Analysis of Strategic Investigations of NAS (Belarus, 2009).

2010 – Cooperation agreement is signed with the Institute of Economics of the National Academy of Sciences of Belarus (Minsk, Belarus, 2010).

2011 – Cooperation agreements are signed with National Institute of Oriental Languages and Civilizations (Paris, France, 2011), Institute of Business Economy at Eszterhazy Karoly College (Hungary, 2011), Republican research and production unitary enterprise "Energy Institute of NAS" (Belarus, 2011). Memoranda of understanding are signed with Jiangxi Academy of Social Sciences (China, 2011), Research and Development Center for Evaluation and Socio-Economic Development and the Science Foundation of Abruzzo region (Italy, 2011).

2012 – Cooperation agreement is signed with Center for Social Research at the Dortmund Technical University (Germany, 2012).

2013 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2013). July 2013 – The application for research performance by international consortium involving ISEDT RAS within the 7th Framework Programme of European Community.

2014 – Cooperation agreement is signed with Center for System Analysis and Strategic Research of the National Academy of Sciences of Belarus (Belarus, 2014). Memoranda of understanding are signed with Jiangxi Academy of Social Sciences (Mao Zhiyong, China, 2014), National Institute for Oriental Studies INALCO (Julien Vercueil, France, 2014).

2015 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2015). Cooperation agreement is signed with the Institute of Sociology of the National Academy of Sciences of Belarus (Belarus, 2015).

2016 – Cooperation agreements are signed with the Center for the Study of Industrialization Modes of the School of Advanced Studies in the Social Sciences (EHESS) (Paris, France, 2016); Institute of Philosophy, Sociology and Law of NAS RA (Yerevan, Armenia, 2016); Yerevan Northern University (Armenia, 2016), Yerevan State University (Armenia, 2016). Memoranda of understanding are signed with Jiangxi Academy of Social Sciences (China, 2016).

2018 – Cooperation agreements are signed with the Department of Agrarian Sciences of the National Academy of Sciences of Belarus (Belarus, 2018); the Republican Unitary Enterprise "Scientific and Practical Center of the National Academy of Sciences of Belarus for Agricultural Mechanization" (Belarus, 2018). Memorandum of understanding is signed with the European School of Social Innovation (ESSI) (Germany, 2018).

2019 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2019).

2020 – Memorandum of understanding is signed with Jiangxi Academy of Social Sciences (China, 2020).

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Focus on Finances as a Factor of Russia's National Vulnerability in the 21st Century

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Abstract. The research, presented in the current article, is a logical continuation of a previous "Editorial" article, which was about the soullessness of the ruling elites, analysis of its reasons and consequences. This article focuses on common global consequences of liberal capitalistic ideology actively implemented by the ruling elites. The authors explore its historic purpose and tools, use the facts, and analyze results shown in specific changes of social assessments and attitudes. In the context of a comparative analysis of dynamics of public opinion in the key countries of Western Europe, we describe the trends of subjective assessments of the population in the Russian Federation. The authors conclude that many negative consequences of the purposeful policy of global elites (in particular, ones related to the destruction of the

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system of traditional values and norms) exist in Russia, which requires increased attention and active state policy in matters related to the development of ideology and overcoming the soullessness of the ruling elites as a natural attribute of the historical period of postmodernity. The study is based on respected international sources of official statistical information (World Bank) and sociological measurements (European Social Survey, Edeleman Trust Barometer), as well as on the results of Russian and regional public opinion polls.

Key words: soullessness, ruling elites, national interests, society, postmodernism.

In the previous article[1], we analyzed reasons and consequences of soullessness of the ruling elites that is a clear result of the main principle of liberal capitalism – "to always look for personal profit". We concluded that soullessness is the main source of contradictions accumulating in society and the public administration system. Therefore, it is necessary to look for a solution to this problem, first, in the spiritual, moral, cultural, and value sphere of the ruling elites, who largely set the "rules of the game" for the whole society and are responsible for the effective implementation of national development priorities. We also imply the search for an idea (ideology) that unites the elites and most population.

In this article, we will try to analyze some, in our opinion, negative trends soullessness of the ruling elites leads to and that are a threat to national vulnerability.

How much is ideology in demand in a society that is "focused on the material component of life"[3]? Does it objectively need it, if we take into account that the subjective need for ideology among the Russian population is still giving way to more urgent needs like increase in the level and quality of life, achievement of social justice that are associated with a high level of uncertainty of the future for the state and society in conditions of economic, social, political instability, as well as spiritual and moral degradation, which leads to the dominance of the liberal-capitalist idea in Russia and around the world?

> "It has become common to recognize the predominance of material and egoistic motivations over idealism and solidarity in the mass consciousness and sociological monitoring. Most of the country's social ideals in the 1990s were crumpled up and thrown into the basket of museum artifacts, ridiculed, and stunned... in general, by now, a liberal ideological mindset has been established in the mass consciousness, and even more so – in the elite consciousness"[2].

[1] Ilyin V.A., Morev M.V. Where does the soullessness of the ruling elites lead? *Economic and Social Changes: Facts, Trends, Forecast*, 2021, vol. 14, no. 2, pp. 9–28.

[2] Ageev A. Finding the true azimuth. *Zavtra*. June 11, 2021. Available at: https://zavtra.ru/blogs/poisk_istinnogo_azimuta

[3] Balatsky E.V., Ekimova N.A. Economic determinants of the psychological state of society. *VCIOM Monitoring,* 2008, no. 2, p. 23.

It should be noted that this clarification is not accidental. Many Russian sociologists, analyzing the dynamics of public consciousness in the post-Soviet period, conclude that it is filled with contradictions and antinomies that represent "the existence of mutually exclusive positions, opposing orientations, each of which claims to be true, to realize its right to exist, to implement its attitudes, and ultimately to determine the strategy for the development of society on sufficiently convincing grounds"[4].

> "In Russian conditions, the theories and ideas of Liberal Democrats, being the expression of one point of view without considering another, of the majority of people in this case, had led to existing mutually exclusive views on its future and on ways to realize its long-term goals in post-Soviet Russia... Appearance of antinomies in modern Russian society can be attributed to the gap between the broadcast promises of the ruling elites and things that represent a real life of millions of people"[5].

The reason for their appearance was a deep socio-cultural trauma inflicted on the natural process of the evolution of Soviet society by the betrayal of the ruling elites of the late 1980s-early 1990s, after which the Soviet Union collapsed, and a state arose on its ruins, not just an alien one, but completely and fundamentally contradicting an ordinary Soviet citizen (not only economic, but also socio-cultural, value foundations).

Contradictions in the social perception of many phenomena and processes of modern life have become **a constant attribute of Russian society, inherent in it even now**.

For instance, domestic experts concluded on the "contradictions of the population's historical consciousness". They write that "events turn out to be disconnected from specific historical stages of the country and seem to exist by themselves, outside of history... unambiguously positively evaluated events fall on periods of our history, which are generally perceived either as negative (Stalin's dictatorship), or as generally "forgotten" (the USSR under Khrushchev), which indicates the inconsistency of the historical consciousness of Russians"[6].

Some research results are given in *insert 1*. Data obtained indicate that, during the periods of his presidential terms (compared to the post-war period of the USSR under N.S. Khrushchev and L.I. Brezhnev; before the liberal-capitalist ideology began to penetrate into Russian society under M.S. Gorbachev), V.V. Putin managed to regain people's respect for the church and the army lost in the 90s (30–40%); a sense of patriotism, pride for the country and its international authority (25–39%); opportunities for personal enrichment and professional growth (32–37%); authority of civil and political freedoms (30%).

However, at the same time, compared to the Soviet period, people's perceptions of insecurity in the future have significantly increased (28% under V.V. Putin versus 4% under N.S. Khrushchev and L.I. Brezhnev),

[4] Toshchenko Zh.T. Trauma and antinomy — The new features of public consciousness and behavior in contemporary Russia. *The Journal of Sociology and Social Anthropology,* 2015, no. 1. p. 40.

[5] Toshchenko Zh.T. Antinomy is a new feature of public consciousness in modern Russia. *Knowledge. Understanding. Skill*, 2011, no. 3, p. 65.

[6] Arefiev A.L., Sheregi F.E. Paradoxes of the Russian's mass consciousness. *Herald of the Russian Academy of Sciences*, 2017, vol. 87, no. 8, p. 709.

social injustice (28% vs. 8%), people more often note corruption (48% vs. 9–20%), crime and international tension (20–30% vs. 6%).

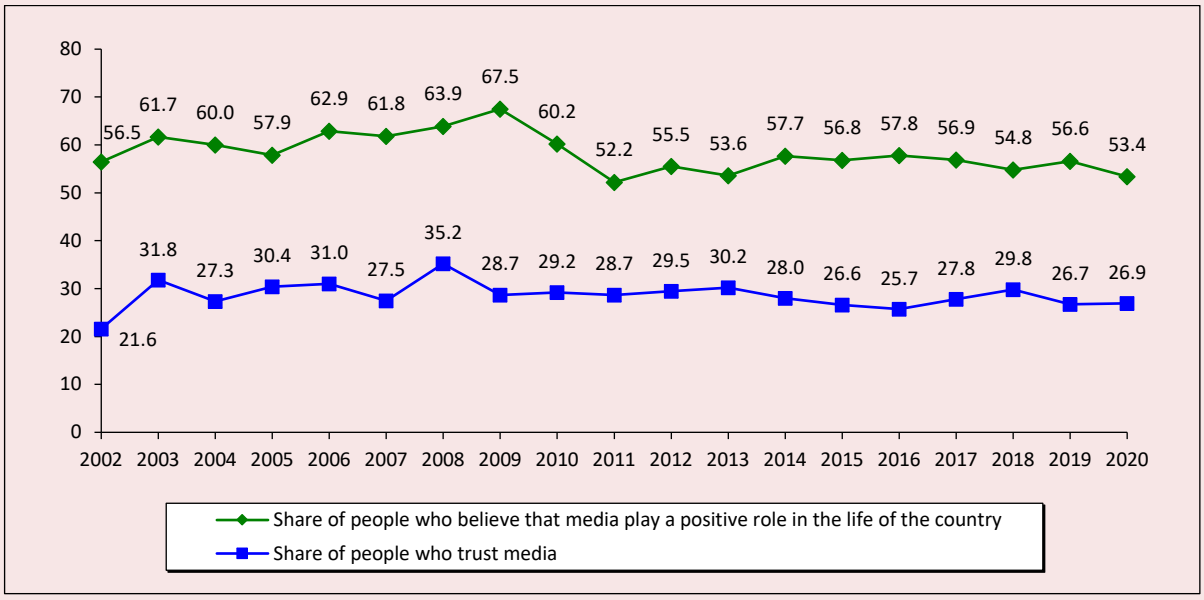
Respondents were less likely to experience feelings of cheerfulness (9% vs. 30%), presence of ideals (8% vs. 25%), equality of everyone before the law (8% vs. 16%), social security (16% vs. 18–37%), the level of trust between people decreased (7% vs. 16–36%).

Significantly fewer citizens mention that, under V.V. Putin, Russia can be proud of its success in the arts (13% vs. 20–27%), science (21% vs. 24–28%), education (10% vs. 25–30%), industry (9% vs. 22–28%), agriculture (7% vs. 20–40%).

Along with all-Russian studies, inconsistency of public consciousness is also shown by data of long-term public opinion monitoring, which is implemented regionally by VolRC RAS. Surveys, conducted in the Vologda Oblast, indicate that more than half of the population (50–70%) consistently noted the positive role of mass media in the life of the country in 2005–2020 *(Fig. 1)*, but no more than 30% of citizens trust them (this is one of the lowest indicators of institutional trust[7]).

Thus, the inconsistency of public consciousness, which emerged during the sociocultural crisis of the early 1990s, is still a characteristic of Russian society.

Figure 1. Assessment of the role of mass media and the level of trust in them, % of respondents



Source: public opinion monitoring data of VolRC RAS.

[7] On average for 2000–2020, the level of trust:

less than 30%: mass media, trade unions, public organizations, Public Chamber of the Vologda Oblast, political parties, business leaders, banking and business circles;

30–40%: Federation Council, State Duma, regional leadership, local self-government bodies, Public Chamber of the Russian Federation, army, court, police, prosecutor's office, FSB;

41% and more: RF President, Government of the Russian Federation, Church.

Insert 1

Respondents' characteristics of various stages of the country's history, %*

Socio-economic features of the stage	Historical periods						
	Russia under the Tsar (before the 1917 Revolution)	USSR under I.V. Stalin	USSR under N.S. Khrushchev	USSR under L.I. Brezhnev	USSR under M.S. Gorbachev	Russia under B.N. Yeltsin	Russia under V.V. Putin
Difficult economic situation	16.7	15.9	10.4	6.7	36.5	52.6	12.5
Fear	12.0	59.3	4.5	3.4	9.5	17.0	6.3
Social security	3.2	7.6	17.8	37.1	3.7	2.5	16.4
Presence of ideals	17.4	34.6	22.1	25.1	5.4	3.7	8.0
International conflicts	6.6	6.7	3.1	5.7	28.2	49.6	28.7
Discipline, order	10.0	53.4	8.9	13.4	2.9	1.4	8.5
Rapid economic development	11.6	27.8	18.5	12.6	3.3	2.6	20.2
Growth of agriculture	15.5	18.4	42.4	18.2	2.7	1.4	6.5
Cheerfulness	5.9	5.4	19.6	30.2	4.5	3.3	9.4
Success in art	24.2	13.3	19.6	26.8	7.3	4.5	13.2
Trust between people	10.0	5.9	16.0	36.3	6.9	3.8	7.0
Universal equality before the law	5.4	13.5	9.0	16.0	3.7	2.0	7.5
Professional growth opportunities	5.0	9.8	15.8	29.0	10.6	10.3	32.1
Opportunity to become a rich person	10.7	1.0	1.6	3.6	15.7	34.0	36.8
Crime, banditry	6.0	6.5	4.4	6.1	35.8	57.2	20.5
Love for the Motherland	37.4	42.7	22.3	31.5	12.7	7.4	24.5
Success in education	8.0	17.8	20.2	34.9	7.6	3.3	10.9

End of Insert 1

Socio-economic features of the stage	Historical periods						
	Russia under the Tsar (before the 1917 Revolution)	USSR under I.V. Stalin	USSR under N.S. Khrushchev	USSR under L.I. Brezhnev	USSR under M.S. Gorbachev	Russia under B.N. Yeltsin	Russia under V.V. Putin
Authority in the world	23.0	35.5	20.4	25.5	10.3	5.8	38.4
Bureaucracy	9.0	14.9	16.8	31.2	33.9	39.0	34.7
Crisis	5.2	4.9	6.2	6.4	38.5	51.3	27.3
Civil and political freedoms	4.7	1.7	7.3	4.2	12.4	17.4	30.2
Achievements in science and technology	7.5	21.8	24.0	28.4	5.6	3.6	21.3
A sense of pride	14.8	25.4	14.9	19.7	5.1	3.2	25.0
Uncertainty about the future	7.3	8.0	3.8	4.1	32.5	46.5	27.5
Respect for the Orthodox Church	50.0	2.1	1.3	2.3	3.9	10.2	39.8
Powerful industry	10.2	28.3	21.7	28.2	3.0	1.8	9.1
Powerful army	13.3	37.9	17.4	25.0	3.5	2.6	29.6
Social injustice	18.0	8.4	7.3	8.4	23.4	41.0	27.5
Corruption, bribes	7.4	4.4	9.5	19.6	36.8	58.5	48.2
Soullessness	1.9	12.7	10.0	10.3	22.7	30.9	14.2

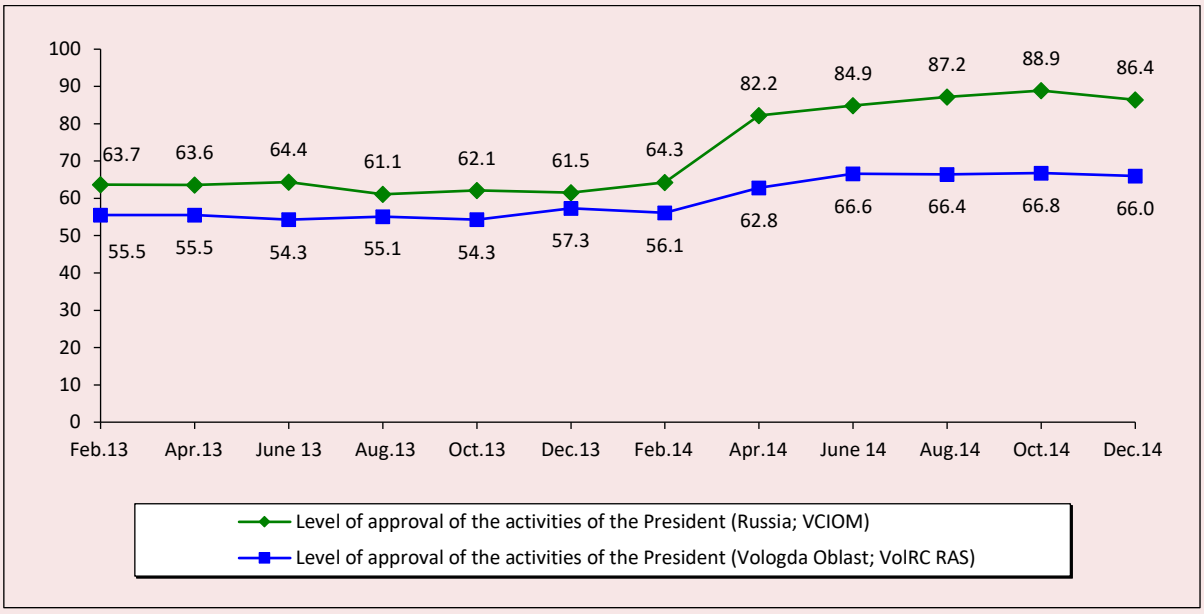
* Green highlights the positive results of the country's development (according to subjective estimates of Russians) during the presidential terms of V.V. Putin compared to the periods of the rule of N.S. Khrushchev and L.I. Brezhnev.
Red highlights the negative results of the country's development (according to subjective estimates of Russians) during the presidential terms of V.V. Putin compared to the periods of the rule of N.S. Khrushchev and L.I. Brezhnev.
The study was conducted by the Center for Social Forecasting and Marketing in May 2016 on an all-Russian representative zoned sample with a quota selection of respondents at the last stage. The sample size is 2,200 people aged 16 years and older.
Source: Arefiev A.L., Sheregi F.E. Paradoxes of the Russian's mass consciousness. *Herald of the Russian Academy of Sciences*, 2017, vol. 87, no. 8, p.710–711.

We can talk about the same inconsistency regarding the need of Russian society for ideology. On the one hand, the President's appeal to socio-cultural aspects in his public statements has always aroused support among the population and formed the basis of the deep state[8].

We can, for example, recall how confidently the level of support for the President of the Russian Federation grew during the "Crimean spring", when many experts called the psychological state of society nothing but "euphoria"[10] *(Fig. 2)*.

The results of voting on amendments to the Constitution, most of which are aimed at strengthening national identity and strengthening the social obligations of the state, are no less indicative[10]. We would like to remind that, on July 1, 2020, more than 74 million people took part in the referendum on

Figure 2. Dynamics of the approval of activities of the RF President by residents of the Russian Federation and the Vologda Oblast, % of respondents



Data for 2013–2014 according to the periods of "waves" of the VolRC RAS monitoring (February, April, June, August, October, December) are presented.

Source: public opinion monitoring data of VolRC RAS.

[8] Surkov V.Yu. V. Putin's long state. *Nezavisimaya Gazeta*, dated Feb. 11, 2019. Available at: http://www.ng.ru/ideas/2019-02-11/5_7503_surkov.html

[9] VCIOM poll: Euphoria from the annexation of Crimea is subsiding. Lenta Novostei Kryma, dated May 5, 2015. Available at: https://crimea-news.com/politics/2015/05/05/87597.html

[10] Such amendments include, for example, the priority of the RF Constitution over the international law; inability to have foreign citizenship for people holding positions critical to ensuring the security and sovereignty of the country; ban on separating Russian territories; state guarantee of affordable and high-quality medical care; mandatory annual indexation of pensions; guarantee of targeted social support, indexation of social benefits and payments; responsibility of the state for protecting rights of Russian workers, as well as the establishment of a minimum wage at the minimum subsistence level, etc.

Table 1. Voter turnout and the share of votes cast for V.V. Putin in the presidential elections from 2000 to 2018, as well as for amendments to the Constitution in 2020

	RF Presidential election								All-Russian vote on amendments to the Constitution (July 1, 2020)	
	March 26, 2000		March 14, 2004		March 4, 2012		March 18, 2018			
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
turnover	75181071	68.74	69581430	64.39	71780800	65.34	73624100	67.54	74215555	67.97
votes	39740434	52.94	49563020	71.31	45602075	63.60	56426399	76.69	57747288	77.92

amendments to the country's Basic Law, and nearly 58 million people supported the vector of Russia's development toward strengthening the foundations of a welfare state *(Tab. 1)*. Indicators were record ones, if we compare them with the support of V.V. Putin during all presidential elections he participated in. It is worth noting that this was, in fact, a referendum on personal trust in V.V. Putin, since, unlike presidential elections, there were no other candidates.

On the other hand, the key problems, which concerned population throughout the post-Soviet period, were financial: poverty, inflation, low standard of living, income inequality, housing provision... On such background, a problem like "soullessness, rampant immorality" simply fades, which, obviously, can be considered a result of the state's management inefficiency that "threw off" concern for the future, including moral and moral image of younger generations, from its shoulders.

Thus, the share of people concerned about inflation increased from 55 to 58% (by 3 p.p.) in 1999–2020; the problem of society stratification into "poor" and "rich" – from 21 to 35% (by 14 p.p.); the problem of housing supply – from 12 to 25% (by 13 p.p.; *tab. 2*). For comparison, maximum 18% of respondents named "soullessness, rampant immorality" one of the most urgent problems during the entire period from 1999 to 2020,

> "...the vector of the evolution of mass consciousness in Russia over the past 40 years is visible: shift in favor of "materialism" and "egoism" has significantly undermined, even switched the course of the system of key values on which the worldview, life guidelines, and behavior of Russians were built...
>
> Two ambitious values burst into Russian life – individualism, with its success at any cost for the sake of power, profit, and fame, and materialism, as a preference of material success to other one – creativity, family happiness, search for truths and similar ideal matters"[11].

In addition, a kind of a marker is that, according to Russian studies[12], material priorities and life success are more important for new generations of Russians than compliance with the laws of morality and morality. We discussed this in more detail in the previous article[13].

[11] Ageev A. Global fuss. *Zavtra.* February 19, 2021.Available at: https://zavtra.ru/blogs/prizhok_v_detnost_

[12] Gorshkov M.K., Sedova N.N. "Self-sufficient" Russians and their life priorities. *Socis*, 2015, no. 12.

[13] Ilyin V.A., Morev M.V. Where does the soullessness of the ruling elites lead? *Economic and Social Changes: Facts, Trends, Forecast*, 2021, vol. 14, no. 2, pp. 9–28..

Table 2. Most urgent problems that concern population*

Problem	1999		2000		2004		2008		2012		2018		2020	
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank
Inflation	54.5	*2*	44.7	*2*	39.5	1	56.3	1	55.3	*1*	53.7	*1*	57.9	*1*
Low standard of living, poverty	57.1	*1*	50.8	*1*	32.8	4	41.4	2	43.2	*2*	51.1	*2*	53.8	*2*
Stratification of population into "poor" and "rich"	21.3	*9*	27.7	*7*	30.8	5	31.4	4	37.5	*3*	35.9	*3*	35.3	*3*
Problem of housing provision, low housing affordability	11.8	*14*	16.8	*9*	23.1	9	36.3	3	28.6	*4*	23.5	*4*	25.0	*4*
Economic instability, stopping of enterprises	39.6	*4*	29.1	*6*	14.8	13	17.0	10	16.5	*11*	22.5	*6*	24.6	*5*
Social insecurity of citizens	32.5	*6*	34.4	*4*	28.7	6	24.8	7	22.3	*8*	19.9	*9*	23.8	*6*
High crime rate, insecurity from criminals, hooliganism	33.4	*5*	36.9	*3*	34.2	3	28.4	5	25.5	*6*	19.0	*10*	20.2	*7*
Political instability	21.9	*8*	16.0	*10*	8.7	17	7.8	15	11.2	*16*	23.1	*5*	19.5	*8*
Corruption, bribery	14.8	*11*	15.4	*11*	18.7	10	17.5	9	19.8	*9*	21.9	*7*	17.5	*9*
Unsatisfactory quality of engineering infrastructure (housing and communal services, roads, transport, etc.)**	n.d.	*n.d.*	n.d.	*n.d.*	n.d.	*n.d.*	n.d.	*n.d.*	25.3	*7*	20.1	*8*	16.7	*10*
Soullessness, rampant immorality	11.6	*15*	15.1	*12*	18.2	*11*	11.0	*14*	12.2	*13*	13.5	*15*	10.7	*17*

* Ranked according to data for 2020. 23 problems were in the survey.
** The answer option has been included in the questionnaire since 2012.
Source: public opinion monitoring data of VoIRC RAS

Thus, analyzing the problem of soullessness, it is important to proceed not only from the subjective need of population to overcome it, but also from the specifics of objective negative consequences that it entails for the state and society.

To do this, we would like to pay attention to two aspects. **The first one – about the results the global ruling elites achieved in a historical fight for global dominance.** According to experts, Biden and the forces behind him embody the culmination of **a historical process** that emerged in the Middle Ages, reached maturity in Modern times with the emergence of capitalist society, and achieved its last stage today – theoretically planned from the very beginning[14].

[14] Dugin A. Manifesto of the Great Awakening. *Official website of the Izborsky Club*. March 6, 2021. Available at: https://izborsk-club.ru/20749

The second aspect is the question how much the values lobbied by the global ruling elites contribute to strengthening the psychological state of society and the foundations of the deep state directly in Russia.

Let us explore data of the respected international project "European Social Survey", in which Russia has been participating since 2006. As stated on the official website of the project, the study is conducted "in most European countries"[15]. For comparison with Russia, we selected key Western Europe countries that have a high geopolitical status and have never missed participating in the project in 2016–2018. Thus, along with the Russian Federation, Germany, Great Britain, and France were included in the sample[16].

In the context of the tasks, set by us, the fact that the level of the economy and the standard of living of the population in these European countries is significantly higher than in Russia says a lot *(Tab. 3)*, especially if we consider national "differences" of the methodology for calculating poverty.

Moreover, it should be noted that, for 2000–2019, average annual GDP growth rates in Russia (+102.9 US dollars on average per year) were significantly lower than in the leading European countries: Great Britain (+177.9), Germany (+241.4), France (+177.9).

> "There are many different methods for identifying and reducing poverty. For example, some consider not monetary poverty, but "poverty due to deprivation": when a family lacks certain goods and services, it is considered dysfunctional, and targeted assistance is provided to it. Nearly 17 such categories of goods and services are in the EU. Our Rosstat considers, if my memory serves me right, 8 of such registered benefits, the absence of which indicates a family's trouble"[17].

Despite this, European states are more covered by the "fire" of mass protest activity than Russia: the protest movement of the "yellow vests" in France (against the increase in fuel prices; 2018), "All Black Lives" groups in the UK (against racism; 2019–2020), "Querdenker 711" in Germany (against the easing of curfew restrictions during the pandemic; 2020), a wave of environmental protests almost throughout Europe and the United States (2019), Brexit in the UK (2016), etc. – these are typical examples of the discontent of ordinary people with the existing standards of efficiency of public administration.

Table 3. Dynamics of GDP per capita*, 2019, in 2010 cons. prices, US dollars

Country	2000	2010	2019	Dynamics (+ / –), 2019 to 2000	Average annual dynamics for 2000–2019
Germany	37934.5	41531.9	47469.5	+4827.8	+241.4
France	38309.4	40638.3	44320.1	+5483.3	+274.2
Great Britain	35672.9	39435.8	43710.5	+3557.8	+177.9
Russia	**6491.1**	**10675.0**	**12011.5**	**+2057.5**	**+102.9**

* Ranked in descending order of GDP per capita in 2019.
Source: World Bank data. Available at: https://data.worldbank.org/indicator?tab=all

[15] *Official website of the European Social Survey.* Available at: http://www.ess-ru.ru

[16] France did not participate in the study in 2012. However, given its status in Europe, we decided to keep its place in the sample.

[17] Exorcist Golikova will expel the poor from the country (interview with V.N. Bobkov). *Argumenty Nedeli.* February 7, 2019. P. 3.

Lukyanov F.A. (chairman of the Presidium of the Council for Foreign and Defense Policy of Russia): **"We deal with a global process.** For various reasons, more and more residents of different countries express distrust in the upper strata... **In general, Russia is not an island, but a continent of stability within the trend. But if there is a trend, the waves roll in, and it is difficult to predict what will happen in the next years"**[18].

Kuznetsov G.S. (head of the Expert Council of the Expert Institute for Social Research): "The common features of the new treaty in the eyes of the protesters are **the state as an instrument for distributing wealth in favor of the majority, justice is not in labor, but in the distribution of benefits.** People just want to get a larger share of the national wealth, considering the current system unfair"[19].

Sokolova E.N. (political scientist, head of the Department of Strategic Research and Forecasting of the EISR): **"Russia and Kazakhstan were at the end of the rating showing street activity of the opposition from different countries,** while a number of protests in the Russian Federation even decreased in 2019"[20].

These facts of real life indicate that the level and quality of life, although they are a prerequisite for achieving a constructive consensus between the government and society, are not its guarantor. Consequently, goal-setting as a function of the public administration system, based on meeting only financial needs of the population, is vulnerable a priori. Such goal-setting any time can lead to internal undermining of the foundations of existing state system, for which it is enough to "throw" into society this or that idea that (as recent years have shown) may seem insane.

"Back in 2008, the French government created a research group led by Professors A. Sen, J.E. Stiglitz, J.-P. Fitoussi. The final report of this group was published in September 2009 (Sen, Stiglitz, Fitoussi, 2009). It shows that GDP (or GRP – internal regional product) very poorly reflects financial well-being of people in society, and its maximization is **a false goal of national policy"**[21].

Data of the European Social Survey allow us to clearly demonstrate the dynamics of the results achieved by the global ruling elites in the process of establishing their dominance – primarily ideological.

On the one hand, we see that, in 2006–2018, the share of people who are tolerant of the rights of sexual and national minorities, as well as those who advocate the continuation of globalization, increased in key countries of Western Europe (Germany, France, Great Britain) (*Insert 2A*). On the other hand, traditional cultural, spiritual and moral values associated with religiosity and, especially, marriage and family attitudes have "shaken", and this has affected not only Europeans.

Thus, in 2006–2018, the share of people who regularly attend religious services in Germany and France decreased (by 4 p.p.; *insert 2B*). In Great Britain, the proportion

[18] Russia is not in a trend: experts have assessed the global protest activity. *RIA-Novosti*. December 11, 2019. Available at: https://ria.ru/20191211/1562290033.html

[19] *Ibidem*.

[20] Russia was at the end of the ranking of countries according to the "protest index". *Gazeta.ru*. December 11, 2019. Available at: https://finance.rambler.ru/other/43330880-rossiya-okazalas-v-kontse-reytinga-stran-iz-mirovogo-indeksa-protestov/

[21] Volkonsky V.A., Gavrilets Yu.N., Kudrov A.V. Liberalism and the state: economic growth and the inequality. *Economics of Contemporary Russia*, 2020, no. 2 (89), p. 149.

of those who consider themselves religious people has decreased (by 2 p.p.). In all studied countries (including Russia), the share of officially married people has decreased (by 15–26 p.p.), as well as the share of those who have (or have ever had) their own or adopted children (for 15–24 p. p.).

It should be noted that the authors position is not aimed at criticizing tolerance itself. As the President of the Russian Federation noted, "there have been, are, and will be no restrictions on rights based on race, sexual orientation, and attitude to religion in Russia"[22], and this, in our opinion, is correct.

The threat is that under the guise of fighting for the rights of certain social groups, the global ruling elites are solving their historical tasks, and not contributing to the achievement of global peace. We have given specific figures indicating a decrease in the population and the discrediting of traditional cultural and value institutions (religions) in insert 2. In *inserts 3–4*, expert opinions are presented, which, in our opinion, show in the most concentrated form the true goals pursued by the global ruling elites, and the tools used to achieve them.

Decline of demographic potential and the destruction of the existing system of spiritual, moral, and socio-cultural values are tools that are purposefully used by the global ruling elites to establish global dominance and create the "breed of service people"[24]. Russian society fully experienced their negative impact during the collapse of the Soviet Union.

Currently, Western Europe countries are influenced by global ruling elites. Deeply traditional nature of Russian mentality, psychological rejection of the "wild 90s" period by most population, historical memory of the USSR as one of the most powerful powers in the world, nationally oriented foreign policy, implemented by V.V. Putin, prevent the negative influence of the "collective West" and preserves the commitment of a significant part of Russians to traditional spiritual and moral values.

"The current diversity of the ideological state of society is characterized by something that can be called "spreading". The further society goes, the more it splits into individual atoms in its value spectrum, each of which has its own micro- and nano-ideology, flexible, usually unsystematic, value orientation, and account in the host of social networks, which is the more valuable, the more original in the sense of the shocking creativity"[23] .

"The experience of the last three decades in Russia shows that most people do not accept not just "crony capitalism"... but the entire capitalist structure of society with its liberal ideology"[25].

[22] Speech by the RF President V.V. Putin at a meeting with the working group on the preparation of proposals for amendments to the Constitution. *Official website of the President of Russia*. July 3, 2020. Available at: http://www.kremlin.ru/events/president/news/63599

[23] Ageev A. Finding the true azimuth. *Zavtra*. June 11, 2021. Available at: https://zavtra.ru/blogs/poisk_istinnogo_azimuta

[24] M.V. Kovalchuk's report at the round table of the Ministry of Defence "Psychological defense. War for History – War for Survival". August 25, 2020. Available at: https://ok.ru/mirovozren/topic/152400692997072

[25] Volkonsky V.A., Gavrilets Yu.N., Kudrov A.V. Liberalism and the state: economic growth and the inequality. *Economics of Contemporary Russia*, 2020, no. 2 (89), p. 152.

Insert 2(A)

Counrty	***Share of people who agree that "gays and lesbians should have the right to lead a lifestyle that corresponds to their views", %***									
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average annual changes from 2006 to 2018	In 2006–2018, unlike the situation in key countries of Western Europe, the share of Russians who believe that "gays and lesbians have the right to lead a lifestyle that corresponds to their views" slightly decreased (by 9 p.p., from 26 to 17%).
Germany	70	81	81	84	87	88	87	+17	+1.42	
France	78	85	82		82	87	89	+11	+0.92	
Great Britain	78	81	84	82	84	87	88	+10	+0.83	
Russia	**26**	**25**	**25**	**20**	**14**	**14**	**17**	**-9**	**-0.75**	

Counrty	***Share of respondents who are tolerant to the arrival of people of different nationality, %***									
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average annual changes from 2006 to 2018	Share of Russians who support the influx of people of other nationalities to Russia has not actually changed in 2006–2018 (11%). In Western European countries, the share of those supporting this opinion has significantly increased: in Germany – by 12 p.p. (from 10 to 22%), in France – by 7 p.p. (from 9 to 16%), in Great Britain – by 12 p. p. (from 8 to 20%).
Germany	10	17	16	21	25	23	22	+12	+1.00	
France	9	9	9		12	14	16	+7	+0.58	
Great Britain	8	8	8	7	10	15	20	+12	+1.00	
Russia	**11**	**11**	**12**	**8**	**8**	**8**	**11**	**0**	**0.00**	

Ending of Insert 2(A)

Country	***Share of people born in the country where they live, %***									
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average annual changes from 2006 to 2018	In Russia, a number of the indigenous population increased slightly from 2006 to 2018 (by 2 p.p., from 93 to 95%). There is a decrease in this indicator by 3-4 p.p. in the leading countries of the Old World.
Germany	91	90	89	88	89	88	87	i4	i0.33	
France	90	92	91		89	90	87	i3	i0.25	
Great Britain	89	89	88	87	85	85	85	i4	i0.33	
Russia	**93**	**95**	**94**	**94**	**94**	**95**	**95**	**+2**	**+0.17**	

Country	***Share of people who agree that "the process of European unification should continue" (share of people who scored more than 5 points on a 10-point scale)***									
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average annual changes from 2006 to 2018	In Russia, from 2006 to 2018, the share of those supporting the unification of Europe decreased by 9 p.p. (from 32 to 23%). In the leading countries of the Old World, the share of those who share this opinion has significantly increased (especially in Germany – by 23 p.p., from 36 to 59%).
Germany	36	42	48	47	55	55	59	+23	+1.92	
France	35	39		35	37	37	39	+4	+0.33	
Great Britain	23	22	19	18	25	25	27	+4	+0.33	
Russia	**32**	**34**	**29**	**17**	**18**	**18**	**23**	**-9**	**-0.75**	

Insert 2(B)

Country	*Share of respondents who consider themselves religious people, %*									Share of respondents who consider themselves religious people increased in Germany (by 3 p.p., from 33 to 36%), Russia (by 8 p.p., from 29 to 37%) and especially in France (by 17 p.p., from 26 to 43%). However, it decreased in Great Britain (by 2 p.p., from 31 to 29%) and many other European countries (Belgium, Switzerland, Finland, Norway, the Netherlands, etc.).
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average annual changes from 2006 to 2018	
Germany	33	38	37	40	37	37	36	+3	+0.25	
France	26	26	26		41	43	43	+17	+1.42	
Great Britain	31	32	30	34	31	30	29	i2	i0.17	
Russia	**29**	**33**	**36**	**35**	**37**	**33**	**37**	**+8**	**+0.67**	

Country	*Share of people who attend religious services at least once a month or on religious holidays, %*									Share of people attending religious services at least once a month or on holidays has significantly increased only in Russia (by 12 p. p., from 31 to 43%). In the UK, it has not changed significantly (30–32%); in Germany and France, it has decreased by 4 p.p. (from 41 to 37 and 34 to 30%, respectively).
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average annual changes from 2006 to 2018	
Germany	41	39	42	42	41	41	37	i4	i0.33	
France	34	31	31		30	29	30	i4	i0.33	
Great Britain	30	31	29	33	32	31	32	+2	+0.17	
Russia	**31**	**36**	**37**	**42**	**39**	**43**	**43**	**+12**	**+1.00**	

Ending of Insert 2(B)

Country	***Share of people who are or have been officially married *, %***									
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average ani nual changes from 2006 to 2018	Share of officially married people decreased in all analyzed European countries, especially in Russia, from 2006 to 2018 (by 26 p.p., from 73 to 47%).
Germany	70	59	86	84	55	54	54	-16	-0.75	
France	68	55	78		54	48	47	-21	-1.75	
Great Britain	70	56	81	83	55	53	55	-15	-1.25	
Russia	**73**	**61**	**89**	**88**	**49**	**51**	**47**	**-26**	**-2.17**	
* The wording of the questions has changed over the years. The answer options are "yes"; "married"; "I am officially married".										

Country	***Share of people who have ever had or adopted children*, %***									
	2006	2008	2010	2012	2014	2016	2018	2018 to 2006	Average ani nual changes from 2006 to 2018	Share of people, who have ever had or adopted children, has also decreased over the past 12 years in all the analyzed European countries. In Russia, this indicator decreased by 24 p. p. (from 72 to 48%).
Germany	65	46	45	47	47	47	47	-18	-1.50	
France	72	51	54		57	58	57	-15	-1.25	
Great Britain	69	48	50	53	56	52	51	-18	-1.50	
Russia	**72**	**50**	**48**	**44**	**47**	**46**	**48**	**-24**	**-2.00**	
* Until 2008, the wording of the question "Have you ever had children?" was used. Since 2008, the question has been changed in "Have you ever had your own or adopted children?". The answer option 'yes" is used.										

Insert 3

Historical policy goals of the global ruling elites

"„Nominalism" laid the foundation for the future of liberalism – both in ideology and economics. A person here was thought of as an individual and nothing more, and all forms of collective identity (religion, class, etc.) were subject to abolition. Starting from nominalism, we can trace the entire path of historical liberalism.

✓ *The first phase was the introduction of nominalism into the religion. The Protestants replaced the collective identity of the Church, as understood by Catholicism (and to an even greater extent by Orthodoxy), with individuals who could henceforth interpret the Holy Scripture, relying only on their own reason and rejecting any tradition.*

✓ *Using Soviet Russia tactically, capitalism initially managed to cope with the fascist regimes, and this was the ideological result of the Second World War. The subsequent "cold war" between the West and the East by the end of the 1980s ended with the victory of the liberals over the communists. Thus, the project of freeing an individual from all forms of collective identity and "ideological progress" in the understanding of liberals has passed another stage.*

✓ *After defeating the last ideological opponent – the socialist camp – capitalism has come to a decisive point... liberals have discovered two more forms of collective identity. First, gender. After all, gender is also something collective: either male or female. Therefore, the next stage was* ***the destruction of gender as something objective, essential, and irrevocable…***

✓ *With the success of the institutionalization of gender policy norms and the success of mass migration, which atomizes the population in the countries of the West itself (which also fits completely into the ideology of human rights, which operates with an individual without considering his cultural, religious, social or national aspects), it became obvious that the* ***liberals have to take the last step and abolish a person****. After all, a person is also a collective identity, which means that it should be overcome, cancelled, abolished.*

✓ *Thus, the last step that remains to be taken by the liberals, who have passed a centuries-old path to their goal, is* ***to replace people – albeit partially – with cyborgs, artificial intelligence networks, and genetic engineering products****... this is predicted to happen in the next 10 to 20 years"*[26].

[26] Dugin A. Manifesto of the Great Awakening. *Official website of the Izborsky Club.* March 6, 2021. Available at: https://izborsk-club.ru/20749

Insert 4

Tools for achieving goals of the global ruling elites

"The hidden meanings of liberal slogans. Let is briefly analyze what is hidden behind these very rules:

✓ ***Democracy.*** *It ensures the dream of a liberal – fair elections. But since an average voter, as a rule, has little education in the management of society..., that is why the masses are extremely manageable, and in practice all elections are reduced to the use of technologies for manipulating consciousness and rigid programming of public consciousness and subconscious attitudes.*

✓ ***Free business, not restricted by the state****. Those who live in Russia have already observed how "entrepreneurs", who came with a bag of criminal money, buy up shops and kindergartens, put their directors, "repurpose" factories and institutes into warehouses of imported consumer goods.*

✓ ***"Personal rights"****. A person is free to completely dispose of himself and decide for himself such issues as the age of entry into sexual relations, abortions, alcohol, and other drugs. And from a young age. But let us not be deceitful: getting high is much preferable for many than preparing school lessons. If the main principle is to live for yourself, why start a family and children, if they so limit the opportunities for self-affirmation?*

✓ ***"Tolerance"****. Tolerance asserts that there are no smart/stupid, qualified/amateurish opinions. There are simply different, but necessarily – equivalent – opinions. Then it is not necessary to know something and understand something. It is quite enough to simply say: "This is my opinion", and that is it. This opinion automatically becomes something that others should listen to with every possible respect.*

✓ ***Freedom.*** *Can there even be an unlimited freedom by anyone and nothing? What will any architectural monument turn into if its bricks and logs are given complete freedom and independence from coercion from cement and neighboring bricks and logs? And in your personal life? We are all adults and we understand what a family will look like in which a husband or wife considers himself absolutely free, not constrained by any ties...*

✓ ***Equality.*** *The most destructive thing is the preached equality between a norm and pathology. I think there are not many normal people who are sincerely convinced that same gender "love" is not an ugliness on the verge of a crime, but "love". And who should you be to declare the normality of taking light drugs?"*[27].

[27] Azarov V. Liberalism as ideology. *Official website of N.Starikov*. July 5, 2012. Available at: https://nstarikov.ru/liberalizm-kak-ideologiya-19077

Nevertheless, Russia is a part of the world, and therefore it feels the influence of global forces. **The "key" to opening the doors to the "Russian world" for them is the ruling elites inside the country, who lobby the interests of the "collective West" considering themselves a part of it. Although they are not.** Russian elites have close family and working ties with the West, but they are all personal. This could be understood if we were talking about only business – mutually beneficial cooperation of entrepreneurs to increase their profits. But, given close interweaving of economic and political elites in Russia, this "mutually beneficial cooperation" becomes part of public administration, which contributes to the personal enrichment of its subjects, but contradicts national interests: mostly the interests of national security and prospects.

This is where the essence of capitalism fully shows itself, when personal material gain pushes into the background ideological issues and national interests.

We are talking about the demographic potential of Russia: perhapsб the quintessence and the main criterion for the effectiveness of public administration.

"Regardless of whether big business acts directly or uses informal lobbying, it has much more "access to politics", more opportunities to influence political decisions compared to most other groups of voters whose interests are not represented professionally or at all.

Voters have one vote in each electoral cycle. But business circles, along with other interested groups, have a second stage when they can finance political parties, express their views through their representatives in official government meetings, as well as through informal lobbying mechanisms. Representatives of large businesses can directly influence government representatives, enter negotiations that are denied to all other citizens, whose interests are often not represented at all. As a result, the interests of most citizens are not considered at all"[28].

"Demography is not an area where only administrative and economic methods are appropriate and effective. The demography reflects the long-term experience of the nation, deep values of individuals and all groups of society, culture – everything that goes back, in the end, to the meaning of life. Although these concepts seem amorphous, the role of reality that they express is enormous"[29].

According to demographers, "in 1990–1999, 9 million fewer people were born in Russia than in 1980–1989... The total natural population decline in Russia for 1992–2008 was 12.6 million people"[30].

[28] Volkonsky V.A., Gavrilets Yu.N., Kudrov A.V. Liberalism and the state: economic growth and the inequality. *Economics of Contemporary Russia*, 2020, no. 2 (89), p. 153.

[29] Ageev A. Global fuss. *Zavtra*. February 19, 2021.Available at: https://zavtra.ru/blogs/prizhok_v_detnost _

[30] There are no superfluous ones here (interview with A. Vishnevsky). *Rossiyskaya Gazeta*. April 7, 2010. Available at: https://rg.ru/2010/04/07/vishnevskij.html

A decrease in the population is a weakening of the country's human and intellectual potential, its competitive advantages, and it is a threat to national security. In his key speeches, V.V. Putin draws attention to the fact that "saving people of Russia is our highest national priority"[31]; one of the new amendments to the Constitution states that "children are the most important priority of Russia's state policy"[32] .

In recent years (especially during the coronavirus pandemic), the President has initiated unprecedented measures to support population: maternal capital, various kinds of social payments, ensuring healthy nutrition in schools, and much more.

However, as many experts note, "**transformation of the world order and demographic problems is not an area where the desired effect is achieved by simply increasing investment in "human capital", which is certainly extremely necessary**... It is necessary to look for solutions not only in the intricacies of the "regulatory framework", but in **understanding the problems and tasks throughout the human life cycle from the cradle to the churchyard, and, most importantly, reasons a person lives for**"[33].

"Even before the coronavirus crisis, Russian birth rates were worse than in many European countries... The coronavirus crisis has worsened the situation.

The state's financial assistance to parents is a vital, but not sufficient measure of demographic policy. It is obvious that after the birth of a child, it is extremely difficult for a family of even three people to live on father's salary, if it is 30–40 thousand rubles. Namely, this is the income of people in towns of central Russia. One-time budget payments cannot radically change them...

Since economic and demographic problems mutually aggravate each other, the way out of the vicious circle is seen in non-economic factors"[34].

The lack of understanding the latter factor, ignored role of this factor in solving demographic problems by the ruling elites, attempt **not to supplement, but to replace it** with intensive usage of material, financial, legal, etc. tools lead to a steadily high proportion of people who are not confident in their future, which, in turn, affects their desire to have children.

"General logic is simple: in order for people to have a desire to have children, it is necessary to significantly improve their prospects for the future"[35].

[31] Presidential Address to the Federal Assembly. April 21, 2021. *Official website of the President of Russia.* Available at: http://www.kremlin.ru/events/president/news/65418

[32] The Constitution of the Russian Federation with amendments for 2020 (Art. 67.1, P. 4). Official website of the RF State Duma. Available at: http://duma.gov.ru/news/48953

[33] Ageev A. Global fuss. *Zavtra*. February 19, 2021. Available at: https://zavtra.ru/blogs/prizhok_v_detnost

[34] Ryazanov V. Non-childish crisis. *Ekspert*, 2021, no. 17, p. 62.

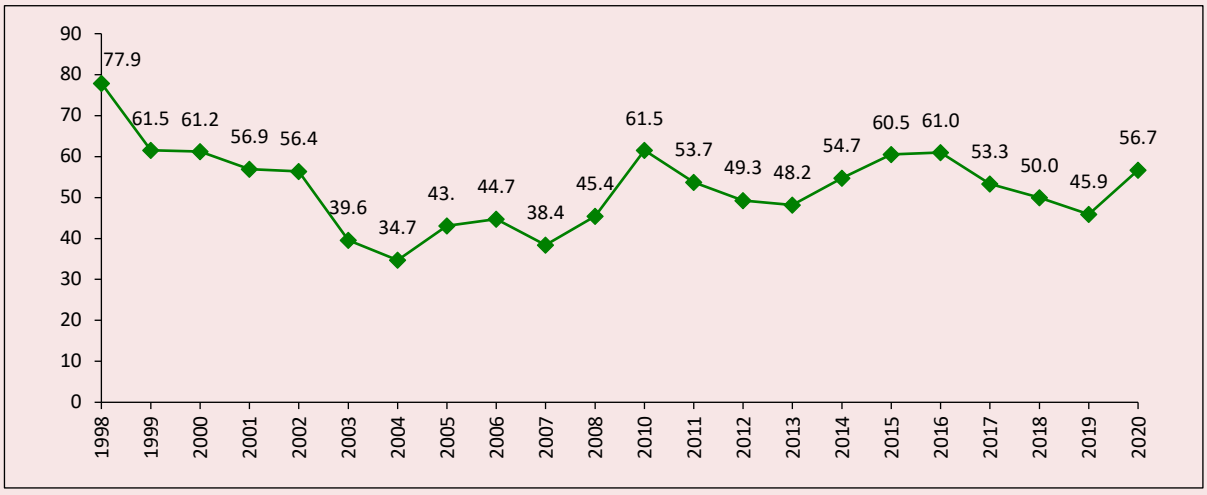
[35] Ryazanov V. Non-childish crisis. *Ekspert*, 2021, no. 17, p. 61.

Data of the public opinion monitoring, conducted by VolRC RAS, show that the increase in the share of people who are not sure about the future has become a record against the background of the COVID-19 pandemic, but **not the only one for the entire measurement period**. Today, in the conditions of enormous uncertainty and complex (not only epidemiological) threats for each person, the share of people who are not sure about their future is 57% *(Fig. 3)*. However, this force majeure situation is quite comparable, for example, with the beginning of the 2000s (2000–2002, when this share was 56–60%) and the middle of the 2010s (2014–2016, 55–61%).

In general, over the period from 2000 to 2020, the share of people experiencing fear of the future decreased by only 4 p.p. (from 61 to 57%), but it is not even a "positive" dynamic that is important, but a significant scale of the spread of disbelief in the future, which over the past ten years is natural for every second person.

Thus, the pandemic and complex negative consequences, caused by it, cannot be considered the source of people's uncertainty about the future (at least, the only one). A real factor is their dissatisfaction with the consequences of the currently dominant liberal-capitalist system of values.

Figure 3. Share of people experiencing uncertainty about the future (Vologda Oblast), % of respondents



Source: VolRC RAS data.

50–60% of people from the studied countries claim that capitalism does more harm than good *(Tab. 4)*. The same number of people are afraid that they will lose their position in society under capitalism. Only 20–35% believe that their families will live better in five years than they do now.

Thus, the results of Russian and foreign studies indicate that **material well-being is not a panacea for problems associated with the level of social tension, state of psychological sympathy of societyб and awareness of its future prospects**.

Focus on the material (in the ruling elites, society) contributes to the achievement of the goals set by the global elites, further development of the country according to the liberal-capitalist idea. It makes it impossible for the international status of the leading powers to be equal in the global political arena (in fact, it levels the real state of the multipolar world) and confuses the probability of cardinal positive shifts in solving the most important problems within the country (canceling the prospect of Russia's competitiveness in the near future).

The real facts, demonstrated by official statistical sources and respected international studies, prove that the fundamental historical confrontation between global forces and national interests of individual states, between the liberal-capitalist ideology and basic principles, expressed in the concept of the

Table 4. Psychological state of population in the studied countries, % of respondents *

Country	Share of people who believe that they and their families will live better in five years	Share of people who are afraid of losing their position in society	Share of people who believe that capitalism does more harm than good
France	19	62	69
Germany	23	52	55
Russia	**34**	**52**	**55**
Great Britain	27	49	53
For reference: *Japan*	*15*	*42*	*35*
Canada	*35*	*48*	*47*
USA	*43*	*55*	*47*
China	*69*	*59*	*63*
India	*77*	*73*	*74*
*Average for 28 countries***	*47*	*57*	*56*

* Ranked in descending order of the share of people who believe that capitalism does more harm than good.
** 28 countries included in the study sample: Thailand, India, France, Malaysia, Indonesia, China, Italy, Spain, the United Arab Emirates, the Netherlands, Colombia, Brazil, Ireland, Mexico, Germany, Russia, South Africa, Kenya, Singapore, Saudi Arabia, Great Britain, Argentina, Australia, Canada, the United States, South Korea, Hong Kong, Japan.
Source: Edelman Trust Barometr – 2020. Available at: https://www.edelman.com/sites/g/files/aatuss191/files/2020-01/2020%20Edelman%20Trust%20Barometer%20Global%20Report_LIVE.pdf

> **"There have been no significant changes in the liberal model of the country for many years, and even the crisis of 2014–2015. The commitment to the liberal model is only confirmed.** Accordingly, the degradation processes that turn into crisis processes also take the form of a stable type of processes.... Thus, the latest historical process, in which Russia is immersed, has become more definite. Based on his qualitative vision, the most likely conservative options, according to the study, are not surprising. **This is a scenario of prolongation of the liberal model, a scenario of balancing on the threshold of sustainable development..."**[36].

welfare state, not just exists, but it becomes more and more culminating. Victory after victory, the global ruling elites automatically increase the level of dissatisfaction with the existing liberal ideology in the world community and simultaneously actualize the need for its change, in a welfare state.

However, so far this discontent has been only growing (although it becomes more and more obvious), while the results of activities of global forces in the context of the world historical process are quite real and tangible: threat of a world war – in politics, destruction of the "collective identity" of spiritual and moral values – in culture, simple decline of population – in demography, dominance of world capital (in private, transnational corporations and cryptocurrencies) – in the economy, purposeful substitution of fundamental, deep humanitarian knowledge for practical skills to handle technological innovations and empirical databases – in science; weaning people on the ability to think and replacing it with a practical ability to find information in an infinite variety of information sources – in education.

Russia is one of the few countries that can (and, in our opinion, must) really resist all these processes. It is not just its internal national but global and historical significance. However, so far, this ideological confrontation is limited to the president's patriotic rhetoric and his conceptual appeals to the ruling elites, to the "collective West". While the practical mechanisms and tools of public administration are in the hands of elite clans and groups that share the basic principles of liberal ideology, it is extremely difficult to count on any progress in the area of a welfare state. On the contrary, we will observe the next achievements of the global ruling elites in the implementation of their historical goals and the ever deeper rooting of the liberal-capitalist ideology in society.

It is necessary to understand a simple thing: if the planting of liberal ideology is not a natural, but an artificial, anthropological process, purposefully carried out by certain forces that

[36] Sulakshin S.S, et al. *Is a Revolution Waiting for Russia? Issues of Transition to the Post-Liberal Model of Russia (Algorithm and Scenarios)*. Moscow: Nauka i politika, 2016. Pp. 669–670.

[37] Ageev A. Finding the true azimuth. *Zavtra*. June 11, 2021. Available at: https://zavtra.ru/blogs/poisk_istinnogo_azimuta

[38] Volkonsky V.A., Gavrilets Yu.N., Kudrov A.V. Liberalism and the state: economic growth and the inequality. *Economics of Contemporary Russia*, 2020, no. 2 (89), pp. 147, 151.

"The category of issues that need to be carefully understood and reflected in ideological models includes, among other things, the problems of statehood, sovereignty, and interdependence. But the main thing now is the knowledge of the problems of subjectivity. Ideologies are created by subjects who can realize, design, and implement a possible and desired future. It is difficult to do this without a clear understanding of vital interests, military-strategic, economic, social, humanitarian, without a clear commitment to ideals, without preserving the shrines of society, without a steady rise in the will to live»[37].

see benefits in this, then the alternative to it should be a "mirror" one – active, large-scale, complex and, first, ideological. If, of course, the state really has a need for this alternative, and it is not just a declaration to retain power.

"It is **the weakness of the state** that actually hinders socio-economic development... The main thing is not economic growth and direct democracy, but the satisfaction of the interests of all social groups and the achievement of social justice... Market competition always generates an increase in inequality. **The only force that can resist this is the state,** which consciously creates mechanisms to reduce the level of inequality, primarily a system of progressive taxation.

More importantly, the state can and should maintain a higher status of the values of serving its country, its people, the state, science, and culture than the value and meaning of personal enrichment... A desire for personal enrichment should not be the main goal for a person.

There are enough people in Russia for whom transpersonal goals and meanings are important – aspirations for the well-being of their country, general well-being, and justice. The state should create conditions that contribute to the formation of these goals and meanings among citizens"[38].

References

1. Balatskii E.V., Ekimova N.A. Economic determiners of society's psychological status. *Monitoring VTsIOM=Monitoring of WCIOM*, 2008, no. 2, pp. 18–25 (in Russian).
2. Toshchenko Zh.T. Trauma and antinomy – the new features of public consciousness and behavior in contemporary Russia. *Zhurnal sotsiologii i sotsial'noi antropologii=The Journal of Sociology and Social Anthropology*, 2015, no. 1, pp. 23–50 (in Russian).
3. Toshchenko Zh.T. Antinomy – a new characteristic of public conscience in contemporary Russia. *Znanie. Ponimanie. Umenie=Knowledge. Understanding. Skill*, 2011, no. 3, pp. 63–72 (in Russian).
4. Arefiev A.L., Sheregi F.E. Paradoxes of the Russian's mass consciousness. *Vestnik Rossiiskoi akademii nauk=Herald of the Russian Academy of Sciences*, 2017, vol. 87, no. 8, pp. 706–715 (in Russian).
5. Gorshkov M.K., Sedova N.N. "Self-sufficient" Russians and their life priorities. *Sotsiologicheskie issledovaniya=Sociological Studies*, 2015, no. 12, pp. 4–16 (in Russian).
6. Volkonskii V.A., Gavrilets Yu.N., Kudrov A.V. Liberalism and the state: Economic growth and the inequality. *Ekonomicheskaya nauka sovremennoi Rossii=Economics of Contemporary Russia*, 2020, no. 2 (89), pp. 147–159 (in Russian).
7. Sulakshin S.S. et al. Rossiyu zhdet revolyutsiya? Voprosy perekhoda k postliberal'noi modeli Rossii (algoritm i stsenarii) [Is Russia Awaiting a Revolution? Questions of the Transition to a Post-Liberal Model of Russia (Algorithm and Scenarios)]. Moscow: Nauka i politika, 2016. 712 p.

[37] Ageev A. Finding the true azimuth. *Zavtra*. June 11, 2021. Available at: https://zavtra.ru/blogs/poisk_istinnogo_azimuta

[38] Volkonsky V.A., Gavrilets Yu.N., Kudrov A.V. Liberalism and the state: economic growth and the inequality. *Economics of Contemporary Russia*, 2020, no. 2 (89), p. 147, 151.

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The Concept of Comprehensive Income in the Economic Theory of the State

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Abstract. The article presents a concept of the comprehensive income of producers of patronized goods; the concept helped to determine the economic content of the term "budget subsidy", which in the Russian tradition is unreasonably interpreted as gratuitous aid from a paternalistic state. We substantiate this concept and the economic meaning of budget subsidy on the basis of a modified model of the Wicksell–Lindahl equilibrium as applied to patronized goods, the distinctive feature of which consists in their ability to satisfy the interests of individuals and the government that acts on behalf of society. We prove that such a modification of the equilibrium model is based on the use of the marginal utility theory in relation to the key term in the theory of patronized goods: public interest that is not reduced to individual preferences. Such an interpretation required that the absolutization of the marginalist principle of subjectivism based on "methodological individualism" should be abandoned. The presence of a public interest that is not reduced to individual preferences, and therefore the presence of the social utility function of the paternalistic state, fundamentally changes the content of the equilibrium. This approach resulted in the development of the concept of comprehensive income, which is defined as the sum of income from market sales and budget subsidies, deflated by different price indices. In order to summarize components of comprehensive income, we present our own methodology for constructing a "composite price index". The normative model for budget subsidy based on the assessment of the social utility of patronized goods is the most important practical result of our work. With regard to its normative nature, the article presents a theoretical substantiation of the three normative conditions and derives the corresponding equations

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for model calculations of the budget subsidy value, tested on the example of national and municipal theaters using actual departmental statistics for the period from 2009 to 2019.

Key words: paternalistic state, patronized goods, "cost disease", productivity, comprehensive income, social utility, subsidy, income, composite index.

For more than fifty years, my research has been related in one way or another to the categories of donations, grants-in-aid, and subsidies. Despite certain differences in these terms (*donations* are provided on non-repayable terms, *grants-in-aid* are allocated for certain purposes, *subsidies* are allocated in the form of co-financing or shared financing of targeted expenditures), they have some fundamentally common features; this, in fact, determines their content. According to the information contained in dictionaries and in relevant articles of the Budget Code, these are different forms of state aid or support. But what is the support of a paternalistic state, what is the economic content of the term "budget subsidy", especially in relation to patronized goods? After the publication of the monograph *The Economic Theory of the State: a New Paradigm of Paternalism* [1], the issue regarding these "fundamentally common features" has become one of the tasks of the economic theory of the state.

Theoretical introduction

If we look into Russia's practice of state funding of patronized goods, for example, in the field of culture, science and education, we will see that the methodology for determining budget subsidies over the past half century has not changed much and differs little from that in the Soviet era. It is still based on the Marxist tradition, which originates in the labor theory of value that defined the cost method that still prevails today. In accordance with it, the financial department works hard to invent various systems for rationing the costs of producers of patronized goods and on this basis calculates the amount of budget subsidies provided, for instance, to theaters, in the form of the difference between their standard expenses and income from events. At the same time, the arbitrary nature and meaninglessness of the expenditure norms in usage once again convince us that such a methodology is flawed.

It has turned out almost impossible to change the ingrained interpretation of the budget funding of patronized goods as a kind of charity on the part of a paternalistic state, especially in relation to the performing arts. Even with the creation of a fundamentally new methodology – an alternative to the cost approach developed in the theory of patronized goods based on marginalist ideas of marginal utility and an emphasis on consumer demand, the state in the face of its financial bureaucracy is clearly in no hurry to abandon the image of a patron of the arts. We should also note that certain difficulties emerge in the course of developing a new approach: it seems that there is no place for budget subsidies in the mainstream of economic theory.

Apparently, for this reason, when dealing with state funding of various economic objects, opponents of the Marxist orthodoxy and advocates of the neoclassical theory and marginalism seek to explain this reality without going beyond the mainstream, and do not consider the state explicitly. Even the great Paul Samuelson preferred not to include the state in the analysis of social cost; on the first page of his famous article "The Pure Theory of Public Expenditure" he hastens to warn the reader: "I assume no mystical collective mind that enjoys collective consumption goods; instead I assume each individual has a consistent set of ordinal preferences with respect to his consumption of all goods" [2, p. 387].

His colleague, the creator of one of the most famous theories of public finance Richard Musgrave [3], when discussing budget expenditures, also ignores the activities of the paternalistic state and constructs its interests as a result of the transfer of individual preferences to the "political trust": "By voting for a particular party, individuals transfer to them the right to express their opinion about what public preferences should be" [4, p. 100–101].

Following Musgrave and his "meritorious paternalism", Richard Thaler – one of the authors of "libertarian paternalism" – in his concept of "Nudge" based on the principles of behavioral economics does not consider social costs at all, believing that in this case the state's intervention is not related to its interests in any way and is caused only by some "true" preferences of irrational individuals [5].

Probably, I need not cite other works of representatives of economic theory that consider the state as a transmitter of people's preferences. This doctrine, which originates in methodological individualism, proclaims a well-known thesis that any interest of society is reduced to individual preferences. In such conditions, the need for budget expenditures disappears on its own[1], so it would not be an exaggeration to say that the mainstream of economic theory has no meaningful explanation of what a budget subsidy is.

Thus, both in Russian practice and in modern economic theory, the essence of the category of budget subsidy has remained, in fact, undefined. This paper presents an attempt to solve this problem, both at the theoretical and methodological level; on the one hand, we abandon the cost approach completely, on the other hand, we use the marginalist tools of marginal utility in relation to patronized goods so as to build a model of budget subsidies, in which the state acts as a full-fledged participant in market relations, having its own utility function.

We emphasize that the proposed solution is based on the concept of economic sociodynamics and the theory of patronized goods [6; 7], which allowed us to consider a paternalistic state that is not somewhere outside the market or above the market, but is organically embedded in it [4, p. 97]. With this in mind, we can get an answer to the general question stated above. We proceed from the assumption that the budget subsidy is an expense of a paternalistic state, conditioned by the social utility of the patronized goods. One of the tasks of the present work is to consider the method for its evaluation.

The empirical part of the study is based on the example of one of the types of patronized goods, namely the products of the performing arts that reflect all the features of production and consumption in the humanities sector of the economy. Given this circumstance, it is necessary to pay attention to the fundamental regularity, which was originally discovered by William Baumol in this sector in relation to the theater. We are talking about the "price disease" or "cost disease" [8]. Its content is conditioned by two factors: the lag in the growth rate of labor productivity from the dynamics of the macroeconomic counterpart, and the lack of a natural mechanism for payroll growth. This disease results in the economic unprofitability of theaters and some other types of patronized goods[2].

Considering Baumol's theory, one should keep in mind specific features of creative activity and technological features of artistic production. Strictly speaking, it is necessary to revise the main conclusion of this theory by interpreting this pattern as a phenomenon of lagging *technological productivity*. The introduction of this category into scientific usage makes it possible to look

[1] We should mention the exceptions to this general conclusion, namely, the redistributive processes of welfare theory and the concept of market failures, requiring appropriate intervention on the part of the government.

[2] This pattern has been repeatedly confirmed in many empirical studies [9–16].

from a general perspective at the economic results of producers of patronized goods, including performing arts organizations, while paying attention to the particular nature of the "cost disease" and the limited manifestation of this pattern. It is explained by the fact that technological possibilities of increasing the market income of theaters and, thus, the growth of technological productivity are limited by the art production itself: "... the amount of labor intended for the production of a given level of product is constant over time and does not depend on innovation and the concentration of capital" [8, p. 415].

At the same time, the history of economic thought and the economic theory convincingly prove the existence of a common civilizational trend in global development – the increasing dynamics of labor productivity due to technological progress, which provides for the replacement of human labor with machines and equipment. The impossibility of such a replacement in art production, in fact, causes the phenomenon of lagging technological productivity in the field of art from productivity in the economy. Baumol convincingly illustrates this fact with his famous example: "... the output of four musicians performing a Beethoven quartet is the same today as it was 200 years ago" [8, p. 416].

The theoretical substantiation of this pattern allowed us to formulate another important conclusion regarding the need to compensate for the income deficit – a direct consequence of the lagging dynamics of labor productivity of theaters and other producers of patronized goods. In addition to the sponsorship of such enterprises and organizations, which Baumol referred to as "stagnant, with little or no technological progress" [17], the main method of covering the income deficit was public financing, which is usually interpreted by financial bureaucrats as the gratuitous assistance provided by the paternalistic state and aimed at compensating for the losses of producers of patronized goods, including performing arts organizations.

The concept of comprehensive income

Changing this interpretation of the budget financing of patronized goods, with its false orientation toward the state's gratuitous aid, required substantiating a fundamentally new approach developed within the framework of the theory of patronized goods. According to this theory, the state is a rational market actor that maximizes its own utility function, reflecting the interests of society as such [18, p. 35]. We also note that in the process of its evolution, the state is transformed into a paternalistic state [1, pp. 168–181].

The use of the main provisions of this theory and the corresponding modification of the well-known Wicksell-Lindahl model allows us to determine the conditions of equilibrium for patronized goods, taking into account individual interests and the interests of society as a whole, the paternalistic state being the bearer of the interests of the latter [19, p. 188–193]. Theoretical substantiation for the use of the Wicksell-Lindahl model is based on the following lemma: "If individuals from the set N present a demand D_1, D_2, ... D_n for the patronized good G and their aggregate demand D_I aggregated through market mechanisms, complements the demand of the state D_S for the same good, then the good G itself acquires the property of duality: while remaining a private good for individuals, it acts as a public good for the pair of aggregates D_I and D_S"[3]. This theoretical conclusion became the basis for the development of a fundamentally new approach to the valuation of the total result of the production of patronized goods.

It is well-known that the Wicksell-Lindahl model considers a public good, the demand for which is presented by two groups of individuals (two aggregated participants) with low and high income, respectively. As Lindahl noted, "the demand of one participant for a public good at a certain price depends on the point of view of

[3] The proof of this lemma in relation to protected goods, where the "mega-individual" and the state are considered as aggregates, is presented in [19, pp. 189–190].

another participant, since the supply of this good is possible only if the entire cost of its production is covered" [20]. The modification of this model for patronized goods also considers two market actors, which are the "mega-individual" and the state. In this case, the demand of the "mega-individual" is the market aggregate of the demand of separate individuals, and the demand of the paternalistic state results from the public choice determined by mechanisms of the political system.

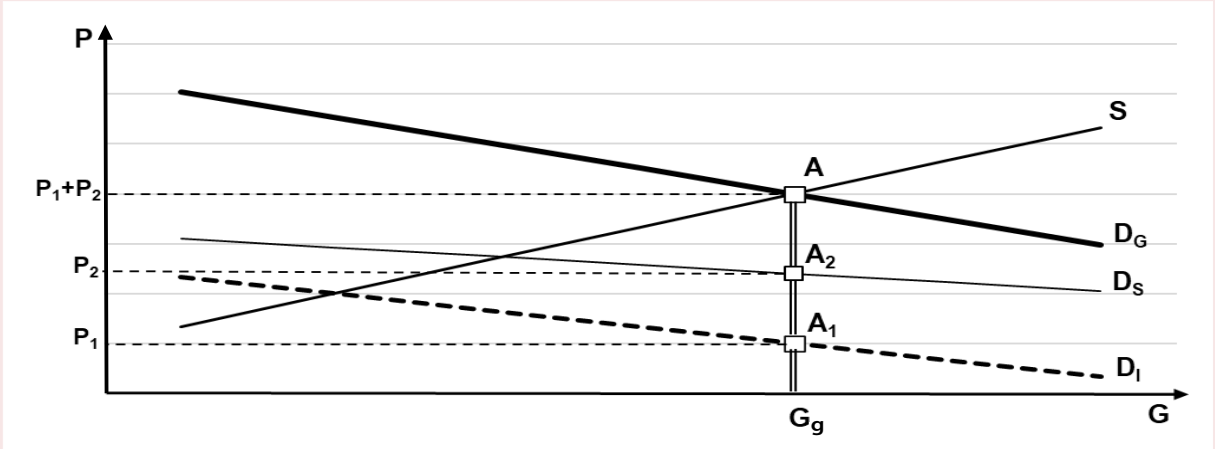
It is necessary to pay attention to the fact that the expenses of the state in accordance with its demand depend on the price at which they are purchased by consumers of patronized goods ("mega-individual"), compensating in total the costs of production in full. The specific feature of the Wicksell-Lindahl model is that "... each individual makes a different tax contribution corresponding to their assessment of the public good" [20, p. 91]. The developed modification of the equilibrium model for patronized goods also considers different prices. We are talking about the price P_1, at which individuals are ready to buy the patronized good, and the price P_2, at which the state is ready to pay for it in the amount of Gg, corresponding to the size of its demand for this good *(Fig. 1)*.

At the same time, economic theory indicates that the equilibrium price (p_1) is based on the marginal individual utility of each unit of the private good G_j; the price paid by the state (p_2) for the entire volume of the patronized good ($G=G_1+G_2+ +G_n$) corresponds to the marginal social utility of the public good G, thus reflecting the amount of budget funds spent on satisfying the demand of the paternalistic state.

Let us formulate a general conclusion. Taking into account that the two participants – individual actors who demand the patronized good and the paternalistic state that seeks to implement its own interests – act in the market simultaneously, we can say that the balance is achieved when the production costs of the patronized good are equal to the sum of proceeds from the market sales of this good ($R = p_1 \times Gg$) and the budget subsidy from the state ($S = p_2 \times Gg$), where R is the proceeds from the sale of the patronized goods, S is the budget subsidy. Strictly speaking, this conclusion describes the equilibrium conditions for any patronized goods and services, including theater goods.

A direct consequence of this conclusion is a new category – the *comprehensive income* of producers of patronized goods, which is the sum of revenue

Figure 1. Modification of the Wicksell-Lindahl equilibrium for patronized goods



from market sales and budget subsidies: GR = R+S. The introduction of this term into scientific usage fundamentally changes the content of all economic processes of production of patronized goods, in performing arts organizations as well. This also applies to labor productivity, where in addition to "technological productivity" there emerges the term "total productivity", which is determined by the ratio of comprehensive income to the number of workers ($P_T = GR/L_T$), where P_T is the total labor productivity in the production of patronized goods, L_T is the number of workers in this production[4].

In these circumstances, in order to determine the comprehensive income of producers of patronized goods, it is necessary to add a market component (for theaters, this is income from events) to its non-market component that corresponds to the volume of the budget subsidy, which, according to the theory of patronized goods, should be equal to the monetary expression of the social utility of theater goods [7, pp. 294–301]. We would like to emphasize that in this aspect, the theory under consideration is consistent with the system of national accounts, where the contribution of subsidized goods to gross value added is also measured by the sum of revenue and budget subsidies.

We should note that the development of the concept of comprehensive income contributed to the formation of new meanings and a new motivation for the activity of a paternalistic state. In this context, the budget funds allocated to theaters can be considered as an investment of the state or as a payment for the derived social utility of the created artistic product [19; 21; 22].

However, this reflection of the budget subsidy in the system of national accounts did not affect the ingrained attitude toward the financing of patronized goods, including artistic products created in the field of art, as an irrecoverable public expenditure. We think that the need to change the prevailing paradigm is long overdue – the traditional understanding of budget expenditures for the production of patronized goods as a kind of the state's charity should be replaced by the concept of investing in human capital and intangible assets that provide deferred external effects determining future economic growth.

The relevance of such a change is confirmed by rapidly developing research in the field of the "new economy", where in the framework of the evolution of the theory of economic growth its current stage is considered; this stage is characterized by its focusing not so much on the standard factors in the Cobb–Douglas function such as labor, capital, exogenous and endogenous technological progress [23; 24; 25], but on human capital and intangible assets [26].

However, despite the achievements in this research area, this methodology in its pure form is not applicable in relation to many types of patronized goods that suffer from the well-known disease of lagging technological productivity. First of all, this applies to theaters, where the features of artistic production generally do not fit in with the achievements of technological progress, conflicting with any replacement of creative labor with machines or equipment. In this context, a separate branch of the "new economy" seems promising, where the subject of research is the assessment of the contribution of state budget expenditures to intangible assets [26; 27]; this to a certain extent allows us to hope for the creation of a methodology and technique for assessing the non-market part of comprehensive income. This, however, requires very significant changes in the system of national accounts.

A certain step in this direction was the recognition of the thesis according to which the expenditures that ensure the growth of future income from the consumption of patronized goods should be considered as investments. Therefore,

[4] With this in mind, it is of obvious interest to test Baumol's cost disease for the indicator of "total labor productivity" of theaters. Such calculations are presented in [22, p. 443].

it is acceptable to assume that budget financing of theaters is an investment in intangible assets – the cost of creating new productions, which have a twofold effect on comprehensive income, on the one hand, increasing the market component as a result of the current consumption of theater goods, on the other – forming the corresponding external effects through the transformation of created artistic values into human capital gains. This content of state funding of theaters determines the way to measure the value of their comprehensive income: it can be measured by the sum of revenue and budget subsidies.

Composite price index

This definition raises a number of methodological questions. First, how to measure the comprehensive income of theaters in real terms at different points in time (in constant prices of the base year), if each of its components is deflated using different price indices: the market part based on the ticket price index [28, p. 73], the subsidy – using the GDP deflator. Second, and this is especially important, how to reflect the structural links between the income from events and the budget subsidy in the dynamics of the comprehensive income of theaters, taking into account the well-known problem of accessibility of theaters to the population [21]. The answer to these questions can be found by determining at each time the weighted average price index, where the weights are the shares of the market and non-market components of the comprehensive income of theaters[5].

1. Simple form. The general solution obtained in this way for any year t can be called the "simple form" of the composite price index

$$I^t_k = \lambda^t_R I^t_T + \lambda^t_S I^t_{GDP}, \quad (1)$$

where I^t_k is the value of the composite price index in year t; I^t_T is the index of average prices for theater tickets in year t; I^t_{GDP} is the GDP deflator in year t; λ^t_R is the share of revenues from events in the total income of the theater in year t; λ^t_S is the share of the budget subsidy in the comprehensive income of the theater in year t.

Using statistical data on the economy as a whole and the activities of Russian national and municipal theaters in the period from 2009 to 2019[6], we can calculate the composite index (I^t_k) as an example, comparing its dynamics with the index of average prices for theater tickets (I^t_T), the average consumer price index in the economy (I^t_{PP}) and the GDP deflator (I^t_{GDP}) *(Fig. 2)*.

Calculations show that before 2012, the GDP deflator was 7.5–11.8% higher than the theater price index and 1.7–2.8% higher than the composite index. After President Vladimir Putin signed the Decree of May 2012[7], the situation changed dramatically and the composite index curve took the median position, being between the GDP deflator and the index of growth in theater ticket prices, which were increasing especially rapidly during this period.

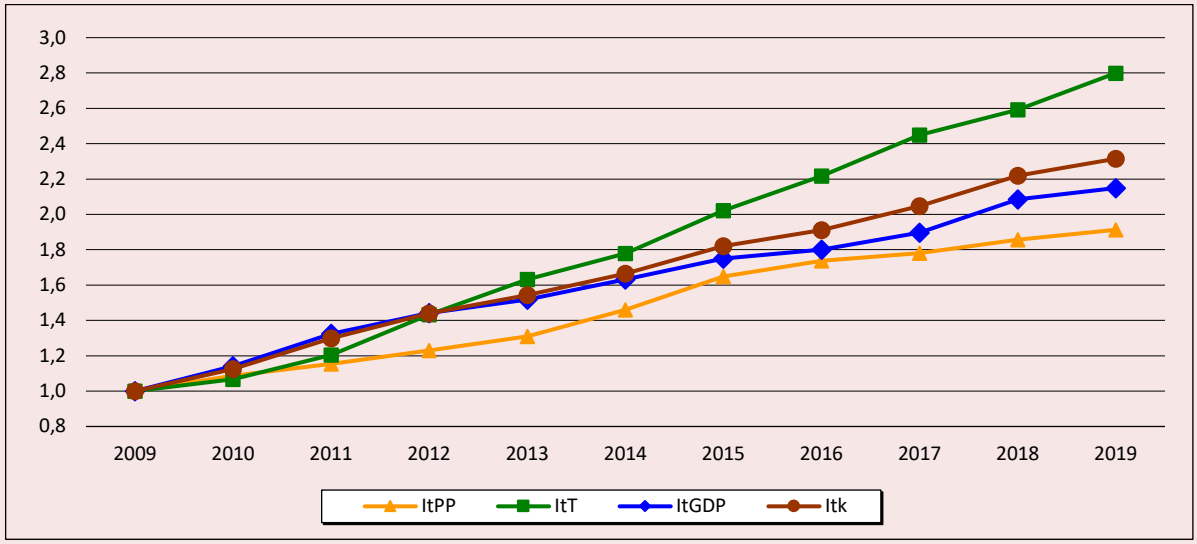
We note that the simple form of the composite index (1) reflects only the actual state of affairs, including the proportions formed in the past period between the market and non-market components of the comprehensive income. At the same time, the tools of the composite index allow us to expand the boundaries of economic analysis and consider a number of situations associated with a hypothetical increase in the share of budget subsidies in the total income of theaters, thereby changing its structure.

[5] I would like to thank R.I. Kapelyushnikov for suggesting this natural solution.

[6] All calculations presented in the paper are based on official statistics. Rosstat: https://rosstat.gov.ru/; Main Information and Computing Center of the Ministry of Culture of the Russian Federation: https://stat.mkrf.ru/indicators/ (accessed May 28, 2021).

[7] Decree of the President of the Russian Federation no. 597 of May 7, 2012 "On measures to implement the state social policy", according to which the salary of employees of cultural institutions was to reach 100% of the average salary in the region's economy by 2018.

Figure 2. Dynamics of the composite index in a simple form



Thus, using the identical equation $\lambda^t_R+\lambda^t_S=1$, we can represent the simple form of the composite price index I^t_k in a slightly different way. To do this, we replace $\lambda^t_R=1-\lambda^t_S$ in the expression (1) and perform the corresponding transformations. As a result, we obtain the following formula:

$$I^t_k = I^t_T + \lambda^t_S(I^t_{GDP} - I^t_T). \qquad (2)$$

The resulting expression (2), where the proportion of the non-market component of comprehensive income is the variable, is the basis for distinguishing two other forms of the composite price index. First, we are talking about its *parametric* form, which allows us to analyze the variations in the proportion of the budget subsidy within a fixed amount of comprehensive income; second – about the *normative* form of the composite index, which takes into account various normative conditions that determine the assessment of the social utility of theater goods and the comprehensive income of theaters.

2. Parametric form. We would like to emphasize that in contrast to the simple form of the composite index, this model reveals additional aspects of the analysis that allow us to answer the question raised above that concerns the relationship between the revenue and the budget subsidy of theaters. In general, we mean taking into account structural changes in the comprehensive income of theaters in the composite price index. At the same time, it is necessary to pay attention to the fact that the ratio of its market and non-market parts is determined by the prices of theater goods. We note that this relationship is reversed: a reduction in the amount of funding forces theaters to raise ticket prices, and, conversely, an increase in theater ticket prices often leads to a decrease in the amount of budget subsidies. This is due to a well-known pattern: the increase in prices for theater goods is, as a rule, the most significant reason for the fall in demand and the reduction in the size of the theater audience. Such processes lead to a decrease in the social utility of theater goods and, accordingly, in budget subsidies as its monetary expression.

Let us quote Baumol: "... the demand for cultural services is elastic in terms of income, but inelastic in terms of price, which means that an increase in ticket prices above *a certain level* (italics added – A. R.) will lead to a decrease in revenue and state support" [29, p. 843]. On the basis of

this judgment, we formulate a general conclusion regarding the prices of theater tickets: their change determines the boundaries of the variable parameter λ^t_S, which characterizes the share of the non-market part of comprehensive income. At the same time, the following two points should be highlighted.

First, a macroeconomic indicator of inflation can be used as a "certain level" of prices (the limits of their maximum values); we are talking about the average consumer price index (I^t_{PP}). Second, taking into account the interest of society in preserving or increasing the social utility of theater goods, without allowing a reduction in the audience, we can assume that the state will seek to create mechanisms to protect the audience from super-inflationary increases in ticket prices. We are talking about an increase in the amount of the budget subsidy, which compensates for the lost profit from the price increase "above a certain level".

We note that the considered increase in the budget financing of theaters entails an increase in the share of subsidies in the comprehensive income of theaters by the amount of $\Delta\lambda^t_S$. In this case, the expression for the composite price index in its parametric form is as follows:

$$I^{*t}_k = I^t_T + (\lambda^t_S + \Delta\lambda^t_S)(I^t_{GDP} - I^t_T) = \\ = I^t_k + \Delta\lambda^t_S(I^t_{GDP} - I^t_T), \quad (3)$$

where I^{*t}_k is the composite index (parametric model) when the share of the non-market part of comprehensive income changes by the value of $\Delta\lambda^t_S$.

It is a difficult task to determine the value of $\Delta\lambda^t_S$, which takes into account the change in the value of the utility of theater goods; apparently, this task can have a normative solution only. The analysis of the literature shows that representatives of the "new economy" are engaged in studying similar problems [25; 27].

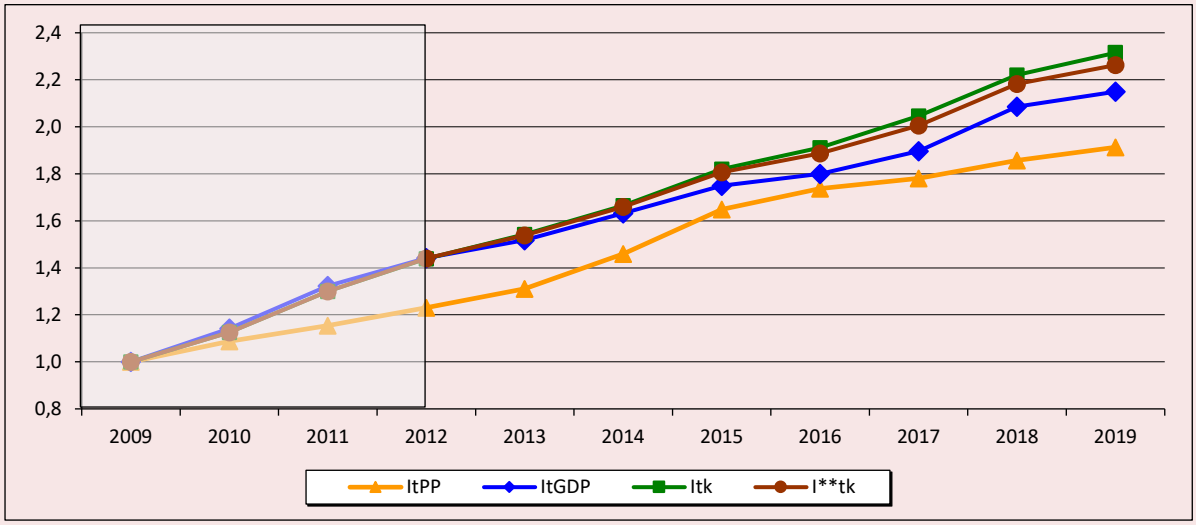
In particular, the methodology and technique for measuring the impact of intangible assets on economic growth that are being developed within the framework of this concept helped to assess the effectiveness of investments for performing arts organizations in New York [30]. We emphasize, however, that even taking into account the impressive results of Rachel Soloveichik, one cannot simplify the task by assuming that the capitalization of intangible assets – performances of the repertoire of theaters that generate income even in the years after spending on new productions – can replace the general definition of the social utility of the results of theaters' activity.

In this paper, the parameter $\Delta\lambda^t_S$ can be considered as a feature of the region of variations in the share of subsidies in the comprehensive income of theaters – a possible increase in subsidies to ensure socially acceptable dynamics of prices for theater tickets from the standpoint of the paternalistic state. Moreover, this region of variation in the proportion of the subsidy has its own natural boundaries: $\Delta\lambda^t_S \in [0;\ 1-\lambda^t_S]$. In this regard, for the lower bound ($\Delta\lambda^t_S = 0$), the composite price index is transformed into its simple form: $\min I^{*t}_k = I^t_k$. The upper bound of the variable parameter ($\Delta\lambda^t_S = 1-\lambda^t_S = \lambda^t_R$) corresponds to the dynamics of the share of revenue from the sales of theater goods in the comprehensive income of theaters. Under these conditions, the composite price index is equal to $\max I^{*t}_k = I^t_k + \lambda^t_R(I^t_{GDP} - I^t_T) = I^t_{GDP}$. Thus, the general expression of the composite index, taking into account possible variations of the parameter $\Delta\lambda^t_S$, will be as follows:

$$I^{*t}_k = \begin{cases} \min = I^t_{GDP}, & \text{if } I^t_T \neq I^t_{GDP} \\ \max = I^t_k, & \text{if } I^t_T = I^t_{GDP} \end{cases}. \quad (4)$$

The description of the range of variations of the parameter $\Delta\lambda^t_S$ and the values of the composite index I^{*t}_k between its lower and upper bounds allows us to consider intermediate cases of the dynamics of this index, including those corresponding to the assumption that the increase in theater prices does not exceed the general

Figure 3. Composite price index in its parametric form ($I^t_T = I^t_{PP}$)



inflation ($I^t_T \le I^t_{PP}$). By substituting $\Delta\lambda^t_S = -\Delta\lambda^t_R = -\lambda^t_R(I^t_T - I^t_{PP})/I_T$ in (3), we can obtain a formula for calculating the desired composite index:

$$I^{**t}_k = I^t_k - \lambda^t_R(I^t_T - I^t_{GDP})(I^t_T - I^t_{PP})/I_T. \quad (5)$$

The calculations performed using this formula have shown quite predictably that with an increase in the budget subsidy in sufficient volume so that the increase in ticket prices would not exceed the growth rate of average consumer prices in the economy, the curve of the composite index in its parametric form (I^{**t}_k) in the period after 2012 turned out to be inside the previously allocated area: between the GDP deflator (I^t_{GDP}) and the composite index (I^t_k). Based on the calculations performed, the following graph is constructed *(Fig. 3)*.

Having analytically determined the range of acceptable values of the composite price index in its parametric form and having performed the necessary calculations for its various options within the range of variation in the proportion of the budget subsidy in comprehensive income, we should consider the normative form of the composite price index.

Social utility and the normative model for subsidies

Let us now focus on the study of the most important model of the composite price index – its normative form, which has two distinctive features. These include, first, the feasibility of an *increase in the comprehensive income* of theaters as a result of an increase in its budget component caused by an increase in the level of social utility of theater goods and, second, a *substantive definition of the conditions* that generate an increase in social utility.

Taking into account the fact that the amount of budget funding depends on the social utility of theater goods, which is always based on the value judgments of the paternalistic state, the main problem remains the creation of institutional mechanisms that limit the "willfulness" of decision-makers, with their philosophy of patronage at public expense. In other words, the existing practice when the regulator makes the decisions that are often wrong should be replaced by meaningful principles of public choice – theoretically substantiated normative conditions for assessing social utility.

1. The three principles of conformity. Discussing this issue within the framework of the theory of patronized goods, we proceed from the fact that the state, as a rational participant in a competitive market, strives to maximize its own utility function. At the same time, it follows from Baumol's theory that the construction of a normative model of budget subsidies should first of all proceed from the expediency of creating conditions for eliminating the lag in the growth rate of *total labor productivity* in the production of patronized goods from productivity in the economy.

This follows from the very fact of the existence of national and municipal theaters. If the state establishes theaters with a view to the social utility of theater goods for which the state makes a demand, and pays for the satisfaction of this demand in accordance with this utility, then according to the theory, theatrical production should provide a productivity that is not lower than the average productivity in the economy. Otherwise, investments in theater activities could be put to better use.

Using the concept of comprehensive income and the category of total labor productivity, we can define the first normative condition. We are talking about the principle of correspondence of the dynamics of the total labor productivity of theaters to the macroeconomic analog – "Norm N_1". Given that the total productivity indicator includes the amount of the subsidy, this normative condition becomes a key element in the assessment of the social utility of patronized goods and thus in the budget subsidy model.

It is necessary to pay attention to another aspect of Baumol's theory, which pointed to the low capital-labor ratio that does not provide the necessary level of income in the performing arts, which belong to the sector with "stagnating productivity" [8, p. 201]. We are talking about the insufficient endowment of theaters with resources for innovative activities involving non-payroll expenses – investments in tangible and intangible assets.

This feature is reflected in the comparative dynamics of the share of labor costs in the comprehensive income of theaters (Y^t_T) and a similar macroeconomic indicator (Y^t_E). The calculations made on the basis of actual data show that in the period under consideration (2009–2019), the share of non-payroll expenses of theaters was about 10% lower than the average in the economy. Given the fact that the value of the indicator Y^t_T is proportional to the ratio of average wages to productivity, we see that the higher level of this indicator in the theater sector, in comparison with the economy as a whole, indicates a relative lag in labor productivity growth from wage growth in theaters; this requires certain explanations.

It is not quite right to attribute this phenomenon to the specifics of creative work and the artistic process, and most importantly, it does not explain anything. On the contrary, continuous updating of theater repertoire as a result of corresponding innovations – creation of new productions, as well as involvement of modern technologies and technical means in the artistic production, is one of the essential features of a repertory theater. And if this process is disrupted or slows down, it indicates a lack of appropriate resources. For theaters, it is more natural when the available funds allow for a corresponding increase in non-payroll expenses.

This circumstance encourages the use of another condition in the subsidy model, which "links" the increase in the capital-labor ratio to the dynamics of wages in theaters. The mechanism of such a "linkage" can be implemented through the introduction of the second regulatory condition – the compliance of the indicator of the share of payroll costs in the comprehensive income of theaters with its macroeconomic counterpart – "Norm N_2". This normative principle makes it possible to replace the shortfall in the incomes of theaters due to technological lag with an increase in the budget subsidy aimed at increasing the capital-labor ratio of creative work, mainly as a result of

investments in non-material (new and thoroughly renewable productions) and material (expenses for the maintenance of the building, computer equipment, light and sound equipment and stage machinery) assets of theaters.

Another theoretical principle that should be considered when constructing a subsidy model is conditioned by the need to find a normative solution to the problem of replacing an objectively absent mechanism for generating payroll. In this regard, we would like to emphasize that since the second half of the 20th century and up to the issuing of the Presidential Decree of May 2012, all payroll revisions and various payroll systems in the field of culture have used, in fact, the same regulation, which determines the degree of compliance of the average monthly wage in this area with a similar indicator in the economy.

In this sense, the actual Russian practice quite fits into the well-known theoretical position about the catching-up nature of payroll in the performing arts, which is justified by the fact that "art organizations compete in hiring workers on the national integrated labor market" [11, p. 92]. This circumstance allows us to assume that the actual payroll dynamics in theaters, including the revisions of remuneration in previous years and the implementation of the Presidential Decree of May 2012, reflects the normative condition for the compliance of the average monthly wage in the theater with its macroeconomic counterpart – "Norm N_3".

2. Normative dynamics of productivity. The theoretical substantiation for the introduction of normative conditions in the budget subsidy model provides for their representation in the composite price index and the growth rate of theater productivity. If we take into account the independence of the price indices I^t_{GDP} and I^t_T from the specified normative conditions, then in accordance with the definition of the composite price index (1) and the identity $\lambda^t_R+\lambda^t_S=1$, the general formulas for determining the composite index $I^t_k(N_j)$ and the index of productivity growth in the production of patronized goods $I^t_{PT}(N_j)$ in the prices of the base year, which meets the normative conditions "N_j", where $j \in [1; 3]$, are as follows:

$$I^t_k(N_j) = I^t_{GDP} + \lambda^t_R(N_j)(I^t_T - I^t_{GDP}), \quad (6)$$

$$I^t_{PT}(N_j) = GR^t_T(N_j) / GR^{t0}_T / I^t_{LT} / I^t_k(N_j), \quad (7)$$

where I^t_{LT}, I^t_T, I^t_{GDP} are indices of growth in the number of workers, ticket prices and the GDP deflator in year t in relation to the base year t_0; λ^t_R is the share of proceeds from ticket sales in the comprehensive income in year t; GR^{t0}_T is the comprehensive income of theaters in base year t_0; $GR^t_T(N_j)$ is the comprehensive income of theaters in year t at current prices, corresponding to the normative condition N_j.

2.1. Treatment of Baumol's cost disease. We note that the normative condition for the dynamics of the productivity of theaters (N_1) should be considered both in terms of the value of their comprehensive income $GR^t_T(N_1)$, which provides a corresponding increase in total productivity, and in terms of the composite price index $I^t_k(N_1)$ that allows us to compare comprehensive income in different years of the period under consideration. Using the expression (6), we can determine the first equation of the relationship between these indicators:

$$I^t_k(N_1) = I^t_{GDP} + \frac{R^t_T (I^t_T - I^t_{GDP})}{GR^t_T(N_1)}. \quad (8)$$

At the same time, for the convenience of the following presentation, we should give a formal definition of the normative condition N_1 and, on its basis, obtain a formula for calculating the productivity growth index corresponding to the fulfillment of this normative condition. In general, this norm can be defined as a proportionality coefficient (N^t_1):

$$I^t_{PT}(N_1) = N^t_1 I^t_{PE}, \quad (9)$$

where I^t_{PE} is the index of growth of average labor productivity in the economy in the prices of the

base year t_0, in year t in relation to the base year t_0; $I^t_{PT}(N_1)$ is the index of growth of labor productivity in theaters that meets the normative condition (N_1) in the prices of the base year t_0 in year t in relation to the base year t_0.

In this paper, we consider a special case: if $I^t_{PT} \le I^t_{PE}$, then $N^t_1=1$ or $I^t_{PT}(N_1) = I^t_{PE}$; if $I^t_{PT} > I^t_{PE}$, then $N^t_1 = I^t_{PT} / I^t_{PE}$ or $I^t_{PT}(N_1) = I^t_{PT}$. Based on this, the theater labor productivity growth index (if $I^t_{PT} \le I^t_{PE}$) can be determined based on the equality $GR^t_T(N_1)/GR^{t0}_T/I^t_{LT}/I^t_k(N_1) = I^t_{PE}$, which implies the second equation of the relationship between the composite index and the comprehensive income of theaters:

$$I^t_k(N_1) = GR^t_T(N_1)/GR^{t0}_T/I^t_{LT}/I^t_{PE}, \quad (10)$$

By equating the left-hand sides of the expressions (8) and (10), we can get equations for calculating the comprehensive income of theaters and budget subsidies that meet the normative condition (N_1):

$$I^t_{GDP}\, GR^t_T(N_1) + R^t_T(I^t_T - I^t_{GDP}) = \\ = [GR^t_T(N_1)]^2 / GR^{t0}_T / I^t_{LT} / I^t_{PE}, \quad (11)$$

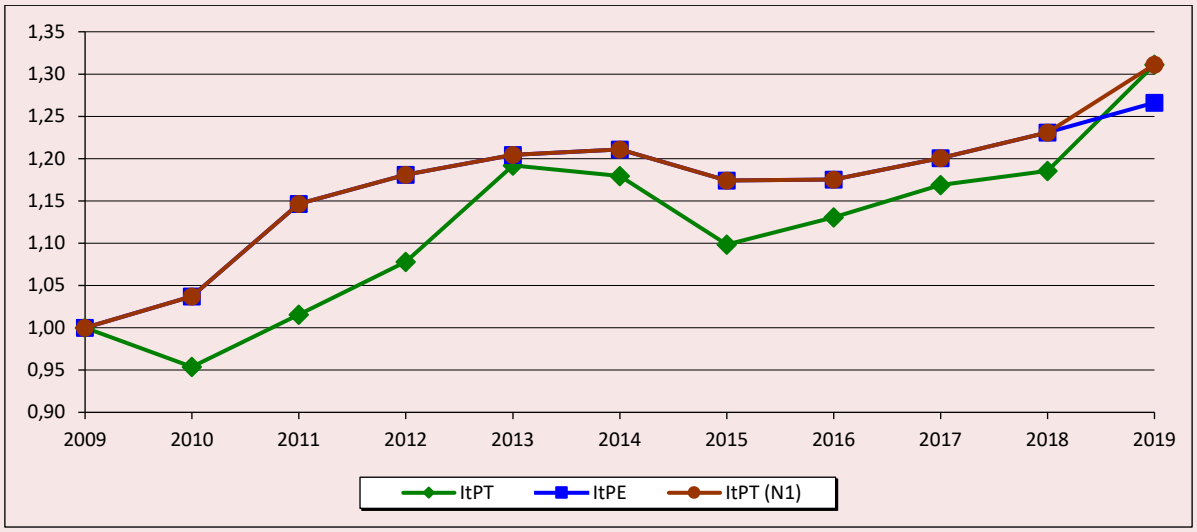
$$S^t_T(N_1) = GR^t_T(N_1) - R^t_T, \quad (12)$$

where $S^t_T(N_1)$ is the amount of the subsidy that meets the normative condition (N_1).

The calculations performed on the basis of the actual data of theater activity in the period from 2009 to 2019 have shown that the quadratic equation (11) with respect to the amount of comprehensive income $GR^t_T(N_1)$ that satisfies the normative condition N_1 has a positive solution in each year of the period under consideration. *Figure 4* shows the estimated dynamics of total labor productivity – the ratio of the normative value of comprehensive income in base year prices to the number of theater workers.

The area between the growth curves of the normative and the actual total labor productivity of theaters $I^t_{PT}(N_1)$ and I^t_{PT} determines the amount of the normative increase in the budget subsidy $\Delta S^t_T(N_1)$. The calculations have shown that in order to overcome one of the symptoms of Baumol's cost disease – lagging labor productivity – the amount of budget subsidies provided to theaters should have been increased by 12.3% in 2010, by 16.5% in 2011,

Figure 4. Comparative dynamics of labor productivity (2009 = 1)



by 12.1% in 2012 and by 8.9% in 2015. In other years, the required increase in the subsidy did not exceed 5%.

2.2. Increase in the capital-labor ratio. In this case, the normative condition N_2 should be formalized as well, by defining it in the form of the appropriate proportionality coefficient (N^t_2):

$$Y^t_T(N_2) = N^t_2 Y^t_E, \quad (13)$$

where Y^t_E is the proportion of payroll expenses in the GDP of the economy in year t; $Y^t_T(N_2)$ is the normative value of the proportion of payroll expenses in the comprehensive income of theatres in year t.

As in determining the first normative condition (N_1), we proceed from the special case when the proportionality coefficient N^t_2 is 1. Then, based on (13), we can get a formula for calculating the standard value of comprehensive income of theaters that reflects the condition N_2:

$$GR^t_T(N_2) = \frac{Lab^t_T}{Y^t_E}, \quad (14)$$

where Lab^t_T is the amount of annual payroll costs in theaters, including accruals, in year t.

Using (6) and (14) and performing the necessary conversions, we can define equations for the composite price index and the index of theater productivity growth that would meet the normative condition N_2:

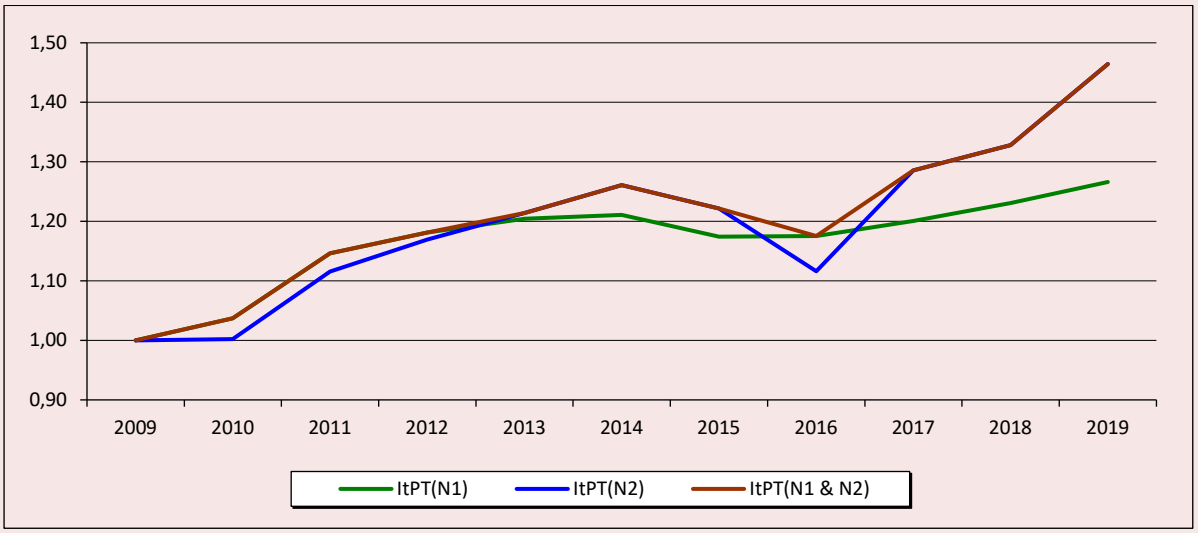
$$Y^t_k(N_2) = Y^t_{GDP} + \frac{Y^t_E R^t_T (I^t_T - I^t_{GDP})}{Lab^t_T}, \quad (15)$$

$$Y^t_{PT}(N_2) = Lab^t_T / Y^t_E / GR^{t0}_T / I^t_{LT} / Y^t_k(N_2). \quad (16)$$

The calculations made with the use of factual data indicate that the dynamics of labor productivity of theaters that meet the condition N_2 in some years of the period under consideration (2010–2012 and 2016) did not ensure the fulfillment of the normative condition N_1. *Figure 5* shows graphs of the indices of growth of the total labor productivity of theaters corresponding to the first and second normative conditions, as well as their simultaneous implementation.

The calculations indicate that when constructing a normative model for the subsidy, it makes sense to consider the simultaneous fulfillment of the conditions N_1 and N_2. In this case, labor productivity growth index for theaters $I^t_{PT}(N_1 \& N_2)$, which meets two normative conditions simul-

Figure 5. Three options for the growth of normative labor productivity (2009 = 1)



taneously, can be determined on the basis of the following expression:

$$I^t_{PT}(N_1\&N_2) = \begin{cases} I^t_{PT}(N_2), & \text{if } I^t_{PT}(N_2) \geq I^t_{PT}(N_1) \\ I^t_{PT}(N_1), & \text{if } I^t_{PT}(N_2) < I^t_{PT}(N_1) \end{cases}. \quad (17)$$

At the same time, for each year t, we can obtain equations for calculating the comprehensive income of theaters and the budget subsidy that meet the normative conditions N_1 and N_2:

$$GR^t_T(N_1\&N_2) = \begin{cases} GR^t_T(N_2), & \text{if } I^t_{PT}(N_2) \geq I^t_{PT}(N_1) \\ GR^t_T(N_1), & \text{if } I^t_{PT}(N_2) < I^t_{PT}(N_1) \end{cases}, \quad (18)$$

$$S^t_T(N_1\&N_2) = GR^t_T(N_1\&N_2) - R^t_T. \quad (19)$$

2.3. Catching up wages. Based on the above-mentioned practice of payroll formation in performing arts organizations, and in accordance with the implementation of the Presidential Decree of May 2012, we can assume that the normative condition N_3 is reflected in the actual dynamics of wages of theater workers W^t_T in the period up to and including 2012 and, starting from 2013, in the normative wage $W^t_T(N_3)$ that corresponds to the roadmap W^t_{TM} established by these Decrees. In this case, we should provide a formal definition of the normative condition N_3:

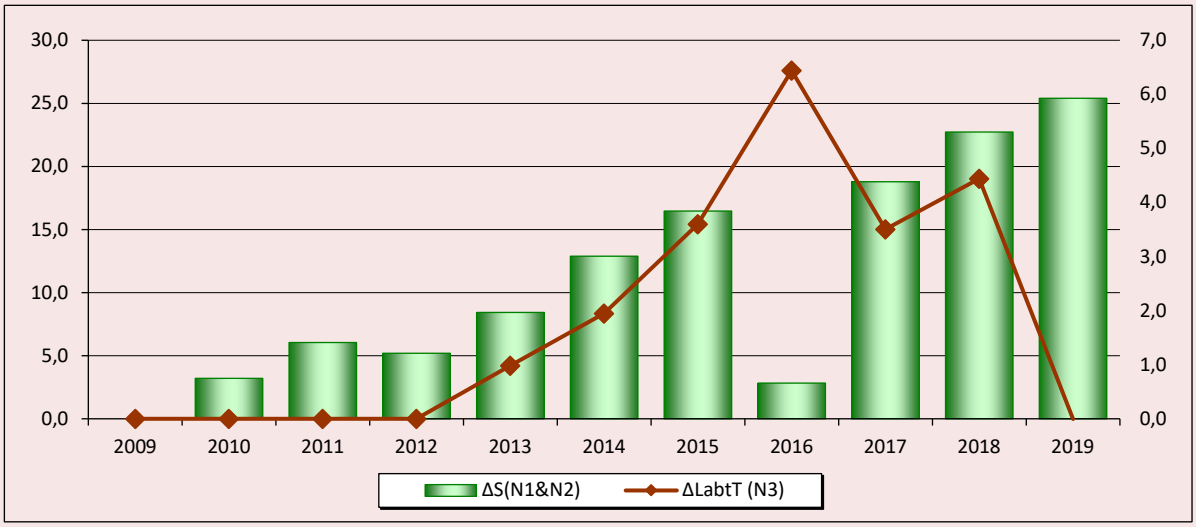
$$N^t_3 = \begin{cases} 1, & \text{if } t < 2013 \\ \frac{W^t_{TM}}{W^t_T}, & \text{if } t > 2012 \end{cases}. \quad (20)$$

Then the standard value of the nominal average monthly wage in theaters corresponds to the following expression:

$$W^t_T(N_3) = N^t_3 W^t_T. \quad (21)$$

We note that the condition N_3 is manifested in the change in the payroll expenses $Lab^t_T(N_3)$ that are required for the implementation of the Presidential Decree of May 2012 as well as in the dynamics of the comprehensive income of theaters $GR^t_T(N_3)$ and its non-market part $S^t_T(N_3)$. The calculation of the subsidy increase in $\Delta S^t_T(N_1\&N_2)$ allows us to find out the extent to which the increase in budget funding, which corresponds to the simultaneous fulfillment of the normative conditions N_1 and N_2, is sufficient to ensure the third condition, associated with the normative increase in the wages of theater workers (N_3). To answer this question, we need to compare the increase in the subsidy $\Delta S^t_T(N_1\&N_2)$ in relation to its actual value, with the necessary increase in payroll expenses $\Delta Lab^t_T(N_3)$ due to the fulfillment of the condition N_3 *(Fig. 6)*.

Figure 6. Comparative dynamics of the increase in the normative value of the subsidy and normative payroll expenses



The above graph shows that the increase in the productivity of theaters corresponding to the simultaneous implementation of the normative conditions N_1 and N_2 could not provide the conditions for the implementation of the Presidential Decrees of May 2012 over the entire interval of the period under consideration. The year 2016 turned out to be the "failing" year, because at that time the standard increase in payroll expenses significantly exceeded the increase in the subsidy corresponding to the simultaneous fulfillment of the conditions N_1 and N_2. Therefore, when constructing a budget subsidy model, one should consider the simultaneous fulfillment of all three regulatory conditions; to do this, we can use the following calculation formulas:

$$\Delta S^t{}_T(N_1\&N_2\&N_3) = \begin{cases} \Delta S^t{}_T(N_1\&N_2), & \text{if } t \neq 2016 \\ \Delta Lab^t{}_T(N_3), & \text{if } t = 2016 \end{cases}. \quad (22)$$

$$S^t{}_T(N_1\&N_2\&N_3) = S^t{}_T + \Delta S^t{}_T(N_1\&N_2\&N_3). \quad (23)$$

We should emphasize that in contrast to the conditions N_1 and N_2, which provide treatment for Baumol's cost disease in terms of productivity dynamics and the increase in the capital-labor ratio, the combination of all three normative conditions (N_1, N_2 and N_3) corresponds to a higher assessment of the social utility of theater goods and implies an increase in the budget subsidy that makes it possible to invest additional funds in human capital – normative wage growth.

On testing the budget subsidy model

Let us summarize the empirical part of the study. The results of testing the subsidy model for Russian national and municipal theaters in the period from 2009 to 2019 are shown in two graphs *(Fig. 7–8)* that present the estimated growth rates of total labor productivity and the dynamics of the budget subsidy, corresponding to all the variants of normative conditions we have considered.

The successive steps that introduced the appropriate normative conditions into the subsidy model helped to determine the growth rate of labor productivity of theaters, which makes it possible not only to cure the Baumol's cost disease, but also to ensure sufficient growth of the budget subsidy to meet the conditions for the normative increase in wages.

The calculations performed allow us to determine the target areas to which the additional budget funds corresponding to the proposed subsidy model should have been allocated. It can be easily done, bearing in mind that the increase in the budget subsidy $\Delta S^t{}_T(N_3)$, which meets the normative condition N_3, should ensure an increase in payroll expenditures in accordance with the roadmap of the Presidential Decree of May 2012. Therefore, the remaining part of the total increase in the subsidy, if all three conditions $\Delta S^t{}_T(N_1\&N_2\&N_3)$ are met, in accordance with the technique for constructing the subsidy model, should be allocated to innovations that ensure the growth of the capital-labor ratio of theaters as a result of investments in their tangible and intangible assets *(Table)*.

Conclusion

The 150 years, in the course of which the economic theory was developing after the "marginalist revolution", have radically changed its mainstream, "melting" the concept of marginal utility and the idea of equilibrium into the core of the neoclassical theory. At the same time, we cannot confirm that marginalism has provided a solution to the entire field of unresolved problems and controversial issues. It is enough to recall "Keynesianism", "institutional theory" and "behavioral economics": all of them abandoned a number of initial provisions of the marginalist theory in one way or another and stood out as independent sections of modern economic science.

Figure 7. Calculated indices for the increase in the total actual and normative productivity of theaters (in constant prices of 2009, 2009 = 1)

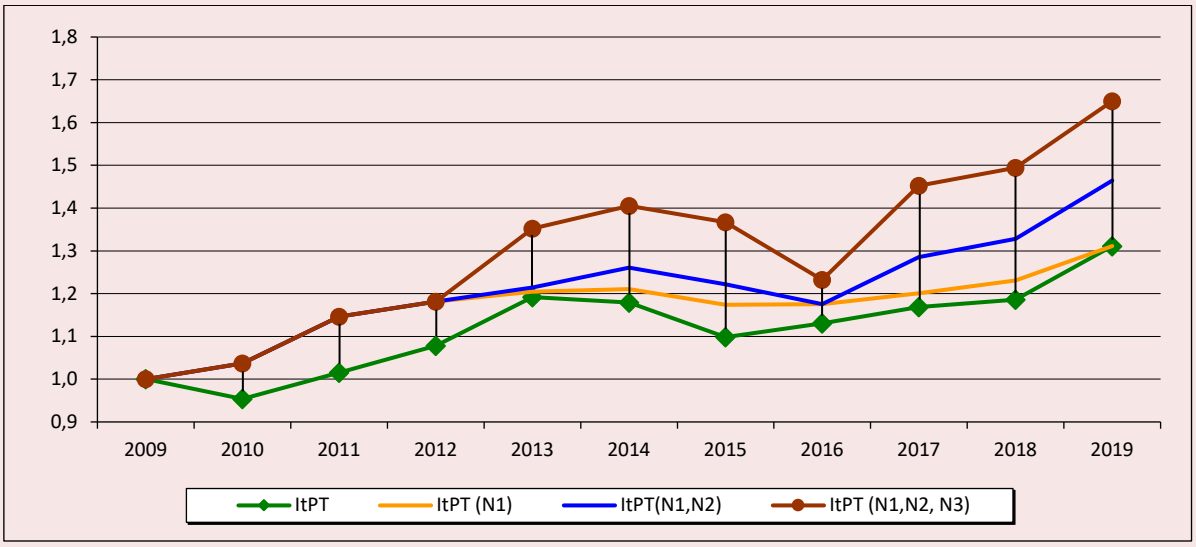
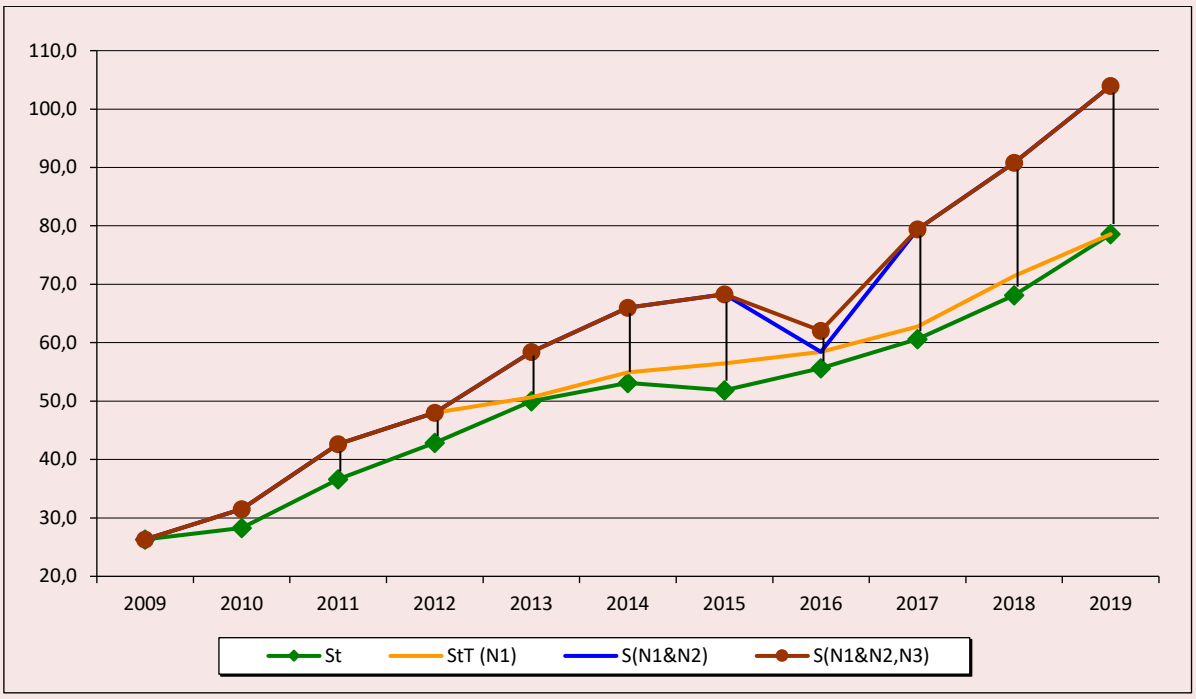


Figure 8. Dynamics of the actual and normative value of the budget subsidy provided to theaters (in current prices), billion rubles



Dynamics of actual and model budget subsidies

Year	Actual amount of the subsidy, billion rubles	Normative (N_1, N_2, N_3) amount of the subsidy, billion rubles	Increase in the subsidy to its actual value, %					
			TOTAL, billion rubles	Including:		TOTAL	Including:	
				to ensure the growth of wages	to promote innovation		to ensure the growth of wages	to promote innovation
2009	26.3	26.3	0.0	0.0	0.0	0.0	0.0	0.0
2010	28.3	31.5	3.2	0.0	3.2	11.3	0.0	11.3
2011	36.6	42.7	6.0	0.0	6.0	16.5	0.0	16.5
2012	42.8	48.0	5.2	0.0	5.2	12.1	0.0	12.1
2013	50.0	58.4	8.4	1.0	7.4	16.9	2.0	14.9
2014	53.1	66.0	12.8	1.9	10.9	24.2	3.6	20.6
2915	51.8	68.3	16.5	3.6	12.9	31.7	6.9	24.8
2016	55.6	62.1	6.4	6.4	0.0	11.5	11.5	0.0
2017	60.6	79.4	18.8	3.5	15.3	31.0	5.8	25.2
2018	68.1	90.8	22.7	4.4	18.3	33.4	6.5	26.9
2019	78.6	104.0	25.4	0.0	25.4	32.3	0.0	32.3

Marginalism, with its rather rigid postulates, failed to overcome the Marxist orthodoxy regarding the costs of a paternalistic state, where the cost approach still prevails. At the same time, the category of "budget subsidy", which is essential for the theory of public finance, has not been filled with a reasonable economic content, thus creating prerequisites for its interpretation as gratuitous state aid, the interpretation that the bureaucrats are very fond of.

In this sense, the semantic content of the term "budget subsidy", obtained on the basis of the modified Wicksell-Lindahl equilibrium model in relation to patronized goods can be named as one of the main outcomes of our present study. We should note in particular that the construction of such a model became possible as a result of combining the marginalist concept of marginal utility with the ideas of the theory of patronized goods, the fundamental difference of which is their ability to satisfy both the interests of individuals and the interests of society as a whole.

We may add that such a "theoretical merger" required the abandonment of one of the most rigid postulates of marginalism based on "methodological individualism". In accordance with the theory of patronized goods, the assumption concerning the presence of a public interest that is not reducible to individual preferences and, thus, the presence of the function of social utility of the state, fundamentally changes the content of the balance for patronized goods. This balance determines the content of a budget subsidy as a monetary expression of the social utility of patronized goods.

A consequence of the theoretical conclusion derived from the modified Wicksell-Lindahl equilibrium model and another important result of the research is the innovative concept of comprehensive income of producers of patronized goods; comprehensive income is defined as the sum of the income of producers of these goods and services from their market sales and budget subsidies. At the same time, the introduction of the category of "comprehensive income" into scientific

usage required that the problem of summing up its various components should be addressed. We are talking about a methodology and technique for constructing a "composite price index", the development of which can be considered as one of the outcomes of the present research.

Perhaps the most important result from the point of view of practice is the proposed normative model of the budget subsidy, which is based on the assessment of the social utility of patronized goods. Taking into account its normative nature, we provide a theoretical substantiation of the three normative conditions and derive the corresponding equations for model calculations of the budget subsidy value, using actual data of departmental statistics for the period from 2009 to 2019. As a result of the calculations, we conclude that theaters were underfunded, especially in the period after the Presidential Decree of May 2012, in the amount of 15 to 32%.

We would like to emphasize once again that the assessment of social utility will always be based on normative guidelines, so it is extremely important that the norms used should reflect the substantive interests of society and should not proceed from arbitrary bureaucratic decisions.

References

1. Rubinstein A.Ya., Gorodetskii A.E., Grinberg R.S. *Ekonomicheskaya teoriya gosudarstva: novaya paradigma paternalizma* [Economic theory of the state: A new paradigm of paternalism]. Saint Petersburg: Aleteiya, 2020. 424 p.
2. Samuelson P.A. The pure theory of public expenditure. *Review of Economics and Statistics*, 1954, no. 36, pp. 387–389.
3. Musgrave R.A. *The Theory of Public Finance*. New York–London, 1959.
4. Rubinstein A.Ya. *Rozhdenie teorii. Razgovory s izvestnymi ekonomistami* [The Birth of a Theory. Conversations with Well-Known Economists]. Moscow: Ekonomika, 2010. 224 p.
5. Thaler R.H., Sunstein C. *Nudge. Arkhitektura vybora* [Nudge: Improving Decisions about Health, Wealth, and Happiness]. Moscow: Mann, Ivanov i Ferber, 2018. 240 p.
6. Grinberg R.S., Rubinstein A.Ya. *Ekonomicheskaya sotsiodinamika* [Economic Sociodynamics]. Moscow, ISE-PRESS, 2000. 276 p.
7. Grinberg R.S., Rubinstein A.Ya. *Individuum & Gosudarstvo: ekonomicheskaya dilemma* [The Individual & the State: An Economic Dilemma]. Moscow: Ves' mir, 2013. 480 p.
8. Baumol W.J., Bowen W.G. *Performing Arts: The Economic Dilemma. A study of Problems common to Theatre, Opera, Music and Dance*. New York: Twentieth Century Fund, 1966.
9. Globerman S., Book S.H. Statistical cost function's for performing arts organisations. *Southern Economic Journal*, 1974, no. 40 (April).
10. Schwarz S., Greenfield H.J. The facts first: A reply to Baumol and Baumol. *Journal of Cultural Economics*, 1981, vol. 5 (2) (December), pp. 85–87.
11. Heilbrun J. "Baumol's cost disease". In: *A Handbook of Cultural Economics*. 2003. Pp. 91–101.
12. Ginsburgh A., Throsby D. (Eds.). *Handbook on the Economics of Art and Culture*. North-Holland, 2006.
13. Neck R., Getzner M. Austrian government expenditures: "Wagner's Law" or "Baumol's Disease"? *International Business & Economics Research Journal (IBER)*, 2007, vol. 6, no. 11, pp. 49–66.
14. Nordhaus W. Baumol's diseases: A macroeconomic perspective, contributions to macroeconomics. *Berkeley Electronic Press*, 2008, vol. 8 (1).
15. Rubinstein A.Ya. *Opekaemye blaga v sfere kul'tury: priznaki i posled-stviya "bolezni tsen"* [Patronized goods in the sphere of culture: Signs and implications of the "cost disease"]. Moscow: Institut ekonomiki RAN, 2012. 78 p.
16. Burakov N.A., Slavinskaya O.A. State paternalism and the econometric model of budget support of the theater. In: *Ekonometricheskie modeli elastichnosti sprosa na teatral'nye uslugi: nauchnye doklady* [Econometric models

of elasticity of demand for theater services: scientific reports]. Moscow: Institut ekonomiki RAN, 2017. Pp. 31–53 (in Russian).

17. Baumol W. Macroeconomics of unbalanced growth: The anatomy of urban crisis. *American Economic Review*, 1967, January, pp. 415–426.
18. Rubinstein A.Ya. *Ekonomika obshchestvennykh preferentsii* [The economics of public preferences]. Saint Petersburg: Aleteiya, 2008. 560 p.
19. Rubinstein A.Ya. *Teoriya opekaemykh blag* [The theory of patronized goods]. Saint Petersburg: Aleteiya, 2018. 305 p.
20. Lindahl E. Die Gerechtigkeit der Besteuerung. Eine Analyse der Steuerprinzipien auf Grundlage der Grenznutzentheorie. Translated by E. Henderson as: Just Taxation – a Positive Solution, 1919. In: Musgrave R.A., Peacock A.T. (Eds.). *Classics in the Theory of Public Financ*e. London: MacMillan, 1958, 4th Impression 1967. Pp. 168–176.
21. Rubinstein A.Ya. *Kul'turnaya deyatel'nost' v kontekste. Ekonomicheskaya teoriya, institutsional'naya sreda, sotsiologicheskie izmereniya* [Cultural Activity in the Context. Economic Theory, Institutional Environment, Sociological Measurements]. Saint Petersburg: Aleteiya, 2019. 1072 p.
22. Rubinstein A.Ya. "An imaginary patient" or what should be the financing of patronized goods. *Ekonomicheskii zhurnal Vysshei shkoly ekonomiki=HSE Economic Journal,* 2020, vol. 24, no. 3, pp. 434–464 (in Russian).
23. Solow R. Technical change and the aggregate production function. *The Review of Economics and Statistics*, 1957, vol. 39, no. 3, pp. 312–320.
24. Mankiw N.G., Romer D., Weil D.N. *A Contribution to the Empirics of Economic Growth*. NBER Working Papers 3541, National Bureau of Economic Research, Inc. 1990.
25. Corrado C., Hulten Ch., Sichel D. Measuring capital and technology. In: Corrado C., Haltiwanger J., Sichel D. (Eds.). *Measuring Capital in the New Economy, Studies in Income and Wealth*. Chicago: The University of Chicago Press, 2005. Vol. 65. Pp. 11–14.
26. Soloveichik R. *Theatrical Movies as Capital Assets. Manuscript.* 2013.
27. Adarov A., Stehrer R. *Tangible and Intangible Assets in the Growth Performance of the EU, Japan, and the US.* Wiener Institut für Internationale Wirtschaftsvergleiche (WIIW), research report 442, 2019.
28. Kapelyushnikov R.I. Productivity and remuneration in the field of art: an alternative interpretation. In: *Ekonomika kul'tury: novyi rakurs starykh problem* [The economics of culture: A new perspective of old problems]. Moscow, 2013.
29. Baumol W. Performing Arts. In: Eatwell J., Milgate M., Newman P. *The New Palgrave: A Dictionary of Economics*. Macmillan, 1987.
30. Soloveichik R. Artistic originals as a capital asset. *American Economic Review*, 2010, vol. 100 (5) (May), pp. 110–114.

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"Black Swans" and Social Institutions

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Abstract. The paper considers the COVID-19 pandemic as a manifestation of an upward trend in various kinds of risks on the path of social development. Promoting the adaptive abilities of socio-economic systems becomes an urgent task. We propose to use the experience of various countries in combating the pandemic to analyze the conditions that help to respond effectively to various unforeseen challenges, which are often referred to as "black swans" in modern literature. We present a brief review of the literature that analyzes the differences between countries, which affect their economic development amidst the COVID-19 pandemic. We prove that, contrary to popular belief, the continued growth of GDP can be combined with relatively low COVID-19 mortality rates. This conclusion is based on data from 30 countries for the year 2020. We note that the share of the service sector in the economy has a significant impact on the dynamics of GDP in the context of the pandemic. We focus on the relationship between changes in GDP in 2020 and institutional circumstances. We find that it is possible to curb the decline in GDP growth rates primarily in those countries where the population trusts the government. The decline in GDP in some countries under consideration occurs against the background of relatively high information and personal freedom that contributes to a decline in the level of trust in the government in the context of the pandemic. The regression analysis confirms that almost half of the differences between countries in GDP dynamics in 2020 are negatively related to two factors: COVID-19 mortality and information freedom. If the people have no trust in the government, then the efforts it undertakes to adapt to an emergency situation may prove ineffective, and social activity can become destructive. In the future, it would be useful to compare the adaptive capacity of countries in terms of the rate of recovery of their economies after the pandemic.

Key words: COVID-19 pandemic, social institutions, trust, GDP growth rates, adaptation, cross-country differences.

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Introduction

The concept of sustainable development is focused on finding a balanced solution to economic, environmental and social issues within the scope of social development. At that, the very possibility of sustainable development is not brought into question, and technological development is perceived as one of the means of its implementation. In particular, the prospects that open up during the transition to digital technology arouse interest.

Due to the COVID-19 pandemic, there has been a surge of attention to unpredictable events, the so-called "black swans", which have become more frequent [1]. For many, the situation regarding COVID-19 has become one of such events, although N. Taleb himself has a different opinion, believing that there was an opportunity to suppress the pandemic in the United States[1].

The upward trend in various kinds of risks and corresponding losses is becoming more and more noticeable. The report "The human cost of disasters: an overview of the last 20 years (2000–2019)" prepared by the UN Office for Disaster Risk Reduction shows that there has been an increase in almost all types of disasters. Losses from natural disasters alone over 20 years are estimated at almost 3 trillion US dollars[2]. The Global Risks Report 2021, an initiative of the World Economic Forum, covers 35 global risks[3]. Their list was updated in 2020, adding 12 new risks that can have long-term consequences, in particular: digital power concentration, backlash against science, mental health deterioration, youth disillusionment.

As for the economic losses from the COVID-19 pandemic, their estimate has increased several times during 2020. In early March, based on the forecast by Oxford Economics, it was said that by the end of 2020, global GDP could lose 1.1 trillion US dollars[4]. In May 2020, the Asian Development Bank (ADB) said that the losses suffered by the global economy due to the COVID-19 pandemic could range from 5.8 trillion US dollars to 8.8 trillion US dollars. This estimate proved twice as high as the ADB's previous April forecast[5]. In October 2020, the International Monetary Fund (IMF) estimated the loss of global GDP at 28 trillion US dollars. The damage to the U.S. economy from the coronavirus pandemic was forecast at 16 trillion US dollars[6].

However, the experience of the pandemic has made it clear that economic damage is only one side of the losses. The disasters we are living through also have a human dimension: direct losses include the loss of life, and indirect losses – the negative impact on people's health[7]. Psychological, political, and socio-cultural consequences of the pandemic are among urgent issues requiring attention.

Against this background, a theory, according to which "technological and social connections between people on a global scale are becoming more and more complex, and they almost inevitably increase the level of risks that can accumulate and, through a cumulative effect, put the entire stability of the global system in jeopardy"[8], is gaining popularity. The effect is also traced in the fact that modern development is viewed as a "slow catastrophe" [2]. Indeed, unlike natural disasters such as earthquakes, typhoons,

[1] https://www.newyorker.com/news/daily-comment/the-pandemic-isnt-a-black-swan-but-a-portent-of-a-more-fragile-global-system

[2] UN Office for Disaster Risk Reduction. The human cost of disasters: an overview of the last 20 years (2000–2019). Available at: https://www.undrr.org/media/48008/download

[3] World Economic Forum. The Global Risks Report 2021. Available at: https://www.weforum.org/reports/the-global-risks-report-2021.

[4] https://russian.rt.com/business/article/725315-ekonomika-poteri-koronavirus

[5] https://www.interfax.ru/business/708741

[6] https://1prime.ru/world/20201015/832166974.html

[7] https://news.un.org/ru/audio/2012/10/1015281

[8] Balabanov O. Society of global risks: when disasters and epidemics become the norm. Available at: https://ru.valdaiclub.com/a/highlights/globalnoe-obshchestvo-riska/

and tsunamis, many risks are cumulative. Their negative influence becomes considerable only after some time. It is what happens with climate change, the maturation of economic bubbles, and the concentration of digital power. With regard to the economy of such risks, we can talk about the economy of a slow catastrophe. In other words, we are talking about the accumulation of negative potential in the course of socio-economic development. We understand "slow" catastrophes as the processes and regularities of the emergence of negative trends in the functioning of an object, their subsequent accumulation, development and modification that is difficult to predict, which eventually lead to a violation of the normal functioning of the object, disorganization of its internal structure, destruction of connections with the environment and other negative consequences" [2, p. 32]. A slow catastrophe can occur as a gradual deterioration in the functioning of the system, as, for example, is the case regarding the residual principle of financing science. An explosive realization of the accumulated negative potential is also possible, which is observed in the collapse of financial bubbles.

Certain types of slow disasters have significant distinctive features that should be taken into account in development strategies. Preparing for possible challenges is one of the most important strategic tasks for different levels of management. It is justified that the agenda of science and practice should include the transition from the concept of "sustainable development" to the concept of development in conditions of permanent risks. Accordingly, it is necessary to talk about the problem of adaptation of systems to such conditions at different levels. The experience of the COVID-19 pandemic provides extensive information for studying this problem. We mean an analysis of the circumstances under which individual countries are able to adapt to this disaster more effectively. At the end of 2020, significant differences between nations are observed in terms of COVID-19 mortality[9] and GDP dynamics[10].

It is a fairly common view that adaptation aimed at maintaining GDP growth is achieved amid aggravating mortality rates, and vice versa, a decrease in mortality from COVID-19 occurs when GDP is falling. Ya. Mirkin writes: "There is a new emerging reality – the economy of catastrophes. It shows the features of a military economy, mobilization economy with restrictions on basic freedoms, with prohibitions from the state that go far beyond everyday life, with supervision of everyone and, finally, with punishments... Something new is emerging in the world – economic sacrifices. As during a war, the authorities sacrifice some of the population in order to "make everything work"[11]. As for preventive actions to respond to black swan events, an important role in this case belongs to the formation of reserves [3]. However, as N. Taleb pointed out, it is possible to be late in responding to new challenges even if you have an extensive resource potential at your disposal[12]. Successful development in the context of permanent risks involves, first of all, building an effective decision-making system. In fact, we are talking about institutional factors that increase the adaptability of socio-economic systems.

We use the example of COVID-19 to analyze whether it is justified to interpret adaptation to risk as a choice between the preservation of either the

[9] World Health Organization. COVID-19 Weekly Epidemiological Update 25. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210202_weekly_epi_update_25.pdf?sfvrsn=b38d435c_4

[10] International Monetary Fund. World Economic Outlook: Managing Divergent Recoveries. Washington, DC, April. Available at: https://www.imf.org/en/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021

[11] Mirkin Ya. Whose response to COVID-19 is better. Comparative economics of disasters. *Vedomosti,* 2020, October 19. Available at: https://www.vedomosti.ru/opinion/articles/2020/10/18/843660-otvet-covid-19

[12] https://www.newyorker.com/news/daily-comment/the-pandemic-isnt-a-black-swan-but-a-portent-of-a-more-fragile-global-system

population or production. We consider a sample covering a significant group of countries to assess the relationship between the dynamics of GDP and the structure of the economy (the share of services in GDP), and the death rate from coronavirus. But our main focus is on institutional circumstances.

Literature review

The impact of COVID-19 on various economic sectors, employment, and population mortality is considered in a large number of publications, a wide overview of which is presented in [4]. During the first wave of the COVID-19 pandemic, numerous studies were already analyzing the factors that determine the situation concerning the pandemic in different countries. These factors include demographic characteristics, citizens' trust, culture, public administration structure, the level of national economic development, etc. [5]. The factors that increase COVID-19 mortality include elderly age, concurrent diseases such as diabetes, considerable income disparities, and a high level of per capita GDP [6]. The latter circumstance is explained by the widespread use of testing in rich countries, the accessibility of overseas vacation, since cross-border travel contributes to the spread of the virus[13].

The pandemic situation in different countries is considered depending on strategic, psychological and institutional factors [7]. Strategic factors are associated with the possibility of using measures (such as hard lockdown, in particular) to contain the spread of coronavirus, for political gains. The impact of psychological factors manifests itself in various ways, for example, through the attitude toward vaccination. In the literature, attention is drawn to the role of panic among the ruling elite [8]. Such panic accounts for excessive restrictions on the activities of entire business areas or the movement of citizens.

As shown in [9], a differentiated ban on movement taking into account different risk groups (more severe restrictions for older groups compared to younger ones) can significantly reduce the number of lives lost and negative economic consequences compared to uniform restricting measures for all age groups. It is found that under a uniform lockdown lasting 434 days, the total number of deaths reaches 1.8% of the population, and the economic costs are about 24.3% of annual GDP, while under a differentiated lockdown lasting 230 days, the mortality rate decreases to 1%, and economic losses – to 10% of annual GDP.

Institutional factors include the level of government efficiency, the level of trust in society, the existence of separate health ministries and health ministers with medical education, the degree of de facto independence of regional authorities in relation to the central government, etc. [4].

All countries resorted to centralized measures during the pandemic, even when federal legisla-tion limited the possibilities for such actions [10]. At the same time, the level of trust in government and the level of interpersonal trust affected the promptness of response of the authorities to the pandemic. Thus, it was found that "more centralized countries with relatively low government efficiency, freedom and public trust, but with separate ministries of health and health ministers with medical education, acted faster and more decisively" [11, p. 3]. On the other hand, "societies with higher interpersonal trust, trust in government and general freedom scores reacted slower to the spread of the pandemic. It could be that where trust is high, the government does not need to intervene with restrictive measures but can rely on people following social distancing recommendations" [11, p. 24]. It is noted that countries with higher freedom might have been more reluctant to restrict it. However, these conclusions were obtained based on a regression analysis of the situation in the initial period of the COVID-19 pandemic prior to April 2020. The

[13] World Health Organization. Coronavirus disease (COVID-2019) situation reports. Available at: https://www.who.int/emergencies/diseases/novelcoronavirus-2019/situation-reports

authors themselves point out that their "results are best conceived as identifying promising hypotheses about the determinants of the national policy responses to the COVID-19 pandemic in Europe..." [11, p. 3].

The effect of trust in government is also noted in [12, p. 3]: "The decline in mobility around mid-March 2020 is significantly stronger in high-trust regions... The effect is especially strong for non-necessary activities (recreation, work and transport) compared to going to the grocery or to the drugstore". The connection with another aspect of trust is revealed after analyzing the situation in the United States. "Countries where individuals trust other people more do comply significantly more with social distancing orders" [13, p. 12]. The study [14] is also based on data from the United States, and it shows that the perception of the risks of the pandemic can be influenced by political preferences of citizens. The work [15] considers mobility across Italian provinces between January and May 2020 and finds robust evidence that after the virus outbreak mobility declined, but significantly more in areas with higher civic capital which is understood as the willingness of citizens to address emerging problems jointly.

As can be seen from the publications presented above, attention is usually focused on the relationship between institutional factors and social distancing in the context of the pandemic. At the same time, the dynamics of GDP often remains outside the scope of analysis.

In countries with a low level of institutional trust, citizens tend to display skeptical attitude toward government directives. This may affect not only the pandemic situation, but also the effectiveness of economic recovery measures. If the level of trust is low, households will limit their consumer spending, and businesses will not invest[14].

The available publications mainly deal with the mitigation of the consequences of the pandemic. Little or no attention is paid to preparations for new challenges and the necessary preventive measures. At the same time, it is noted that most countries that are successfully coping with the pandemic have taken effective preventive actions from the very beginning. This group includes Singapore and South Korea [5]. It is noted that "Many Asian countries had learnt from their experiences during the SARS outbreak a few years back, so they are more prepared on taking the right preventive measures. While most of the Western/European countries see this as a game until the death toll starts to rise" [5, p. 9].

Early detection of those infected with COVID-19 has been an important success factor in the fight against the pandemic. However, a number of countries are facing the problem of imported testing kits that prove ineffective [5]. The unreliability of testing has to be compensated by the severity of restrictive measures, which does not add confidence to these measures, nor does it raise trust in the government.

Many circumstances recede into the background when the analysis of cross-country differences focuses on the setting of government priorities in the context of the COVID-19 pandemic. We mean a choice between protecting the workers and maintaining the level of production. It covers different levels of economic management. A common view is that saving human lives has to be paid for by falling GDP [3; 16]. There is a tendency to view the choice of a strategy for action in the context of the pandemic as a search for a compromise between health and economic costs. The McKinsey Global Institute report argues for prioritizing people's health[15]. On the other hand,

[14] Portes J. Don't believe the myth that we must sacrifice lives to save the economy. Available at: https://www.theguardian.com/commentisfree/2020/mar/25/there-is-no-trade-off-between-the-economy-and-health

[15] McKinsey Global Institute. Will productivity and growth return after the COVID-19 crisis? Available at: https://www.mckinsey.com/industries/public-and-social-sector/our-insights/will-productivity-and-growth-return-after-the-covid-19-crisis

there are concerns that saving lives at the cost of reducing production will eventually result in even greater sacrifices, so keeping workers in jobs and firms in business needs to be the priority[16].

The results of the analysis of statistics of deaths per million from COVID-19 and a change in GDP in 45 countries during the second quarter of 2020 proved dissonant in relation to the above discussions [17]. Contrary to expectations that suppressing the virus, thereby leading to fewer deaths per million, results in worse national economic downturns, M. Smithson reveals the inverse nature of the relationship between these processes [17].

Therefore, it is necessary to make sure that the situation in the second quarter of 2020 is not exceptional. It is advisable to consider the relationship between the mortality rate from COVID-19 and the dynamics of GDP by the end of 2020. The combination of an increase in mortality and a fall in GDP indicates that other factors significantly affect the cross-country differences in GDP dynamics in the context of the COVID-19 pandemic. A number of publications have already drawn attention to the role of institutional circumstances in such cross-country differences. Our paper is intended to bring some clarity to the issue of how these circumstances affected the economic performance of countries in 2020.

Data and methodology

The sources of information for a comparative analysis of the adaptive qualities of different countries in the context of the pandemic include, on the one hand, data on changes in national GDP indicators, on the other hand, data on COVID-19 mortality.

In a number of studies [18; 19], mortality rates are compared by case fatality ratio (CFR), which estimates this proportion of deaths among identified confirmed cases. However, the dependence of the indicator on testing capacity for COVID-19 leads to the fact that the mortality rates are underestimated for those countries where, as a result of mass testing, many people with mild forms of the disease and without any symptoms are included in the number of confirmed COVID-19 cases. Since CFR may overestimate the actual mortality from coronavirus if testing capacity is low, it is better to use the indicator of the number of deaths from COVID-19 per 100 thousand for comparative analysis. The relevant data are available on the website of the Johns Hopkins Coronavirus Resource Center[17], in the COVID-19 Weekly Epidemiological Update of the World Health Organization, which records the COVID-19 epidemiological situation. The present paper used data from the COVID-19 Weekly Epidemiological Update 25[18].

Data on the change in GDP of different countries in 2020 are presented on the websites of the OECD, the International Monetary Fund. The present paper used data from the World Economic Outlook 2021[19].

One of the sources of information about the institutional features of countries is the Edelman Trust Barometer survey, which has been conducted since 2000. It reveals the level of trust in the institutions of government and business, and the media. The present paper uses data from the Edelman Trust Barometer 2020[20].

[16] Portes J. Don't believe the myth that we must sacrifice lives to save the economy. Available at: https://www.theguardian.com/commentisfree/2020/mar/25/there-is-no-trade-off-between-the-economy-and-health

[17] https://coronavirus.jhu.edu/map.html

[18] World Health Organization. COVID-19 Weekly Epidemiological Update 25. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210202_weekly_epi_update_25.pdf?sfvrsn=b38d435c_4

[19] International Monetary Fund. World Economic Outlook: Managing Divergent Recoveries. Washington, DC, April. Available at: https://www.imf.org/en/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021

[20] Edelman Trust Barometer 2020. Available at: https://www.edelman.com/sites/g/files/aatuss191/files/2020-01/2020%20Edelman%20Trust%20Barometer%20Global%20Report_LIVE.pdf

Table 1. The countries included in the sample

Argentina	Iran	Philippines
Australia	Italy	Poland
Brazil	Japan	Russia
Canada	Kazakhstan	Saudi Arabia
China	Korea	South Africa
Egypt	Malaysia	Spain
France	Mexico	Thailand
Germany	Holland	Turkey
India	Nigeria	UK
Indonesia	Pakistan	USA

Also, the source of institutional information is the Fraser Institute, which is considered the best think tank in Canada and is among the top 15 such centers according to the global Go To Think Tank Index. The present paper takes into consideration the Human Freedom Index 2020 study published by the Institute in December 2020 [20].

A wide range of country-specific information is available on the website TheGlobalEconomy.com, which we used, in particular, to get the data on value added in the service sector as a percentage of GDP.

Most of the results presented in the paper are based on the analysis of the development of a group of countries amidst COVID-19 *(Tab. 1)*.

We selected these countries due to the available statistics and the desire to cover all major states and different continents. After the pandemic is overcome, we find it useful to conduct a comparative analysis to see the development dynamics of big and small economies, developed and developing economies.

When considering the relationship between GDP dynamics and trust in government, Egypt, Iran, Kazakhstan, Nigeria, Pakistan, the Philippines, and Poland remained outside the scope of the analysis due to the lack of trust data for 2020.

Factors in cross-country differences in GDP dynamics by the end of 2020

Analysis of data for 30 countries for the entire year 2020 confirms M. Smithson's conclusion [17]. The data do not allow us to interpret the increase in mortality from COVID-19 as a condition for maintaining GDP growth rates *(Fig. 1)*. Judging by the situation presented in the figure, a decrease in GDP growth rates is often not an alternative to saving human lives.

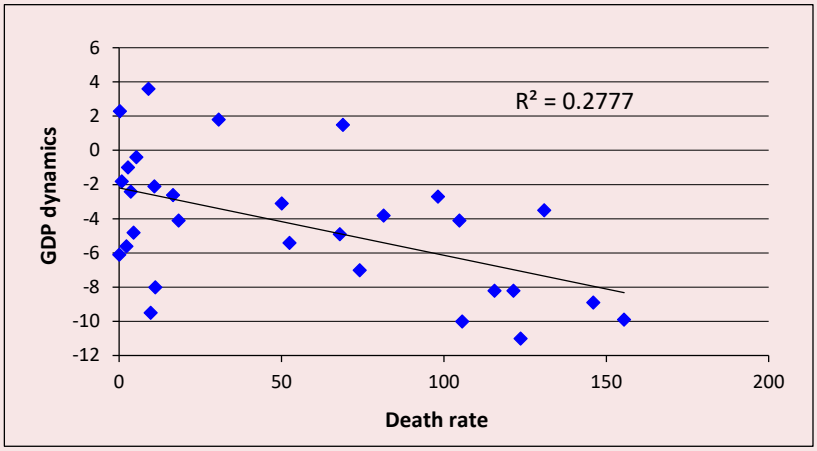
Consequently, the desire to preserve human lives is a weak explanation for the decline in GDP of many countries in the context of the pandemic. Under these conditions, the share of the service sector in the structure of the economy has a significant impact on GDP dynamics *(Fig. 2)*.

It is more reasonable to link the deterioration of the economic situation to the quality of social institutions, especially the low level of trust in government *(Fig. 3)*. The Edelman Trust Barometer estimates this level by the proportion of people who believe that the government is acting in the right way.

The relationship between the dynamics of GDP and the level of trust in non-governmental organizations, business, and the media for a sample of 23 countries has proven much weaker than for trust in government ($R^2 < 0.1$ for the media, $R^2 < 0.04$ in the other two cases). However, there is some connection between the fall in GDP and the freedom of the media *(Fig. 4)*.

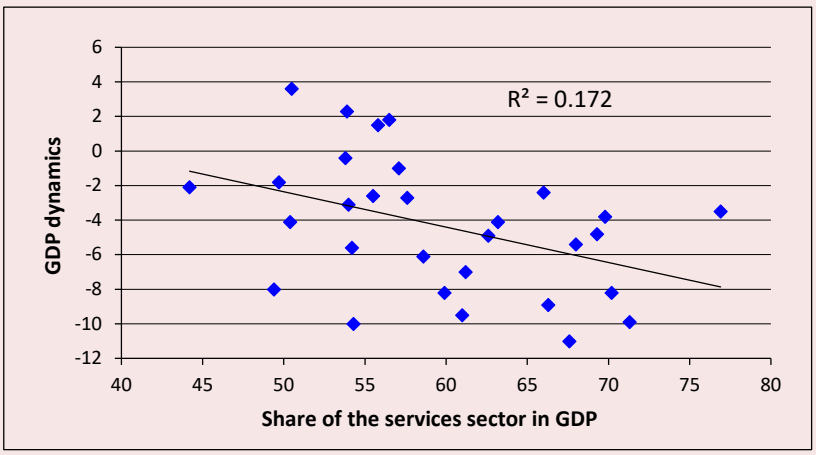
The Human Freedom Index 2020 estimates the level of information freedom by a number of parameters, including the security of journalistic activities, access to foreign media, and state control of the Internet [20]. In many cases, the media is

Figure 1. COVID-19 mortality rates per 100,000 people and GDP growth rates for 30 countries



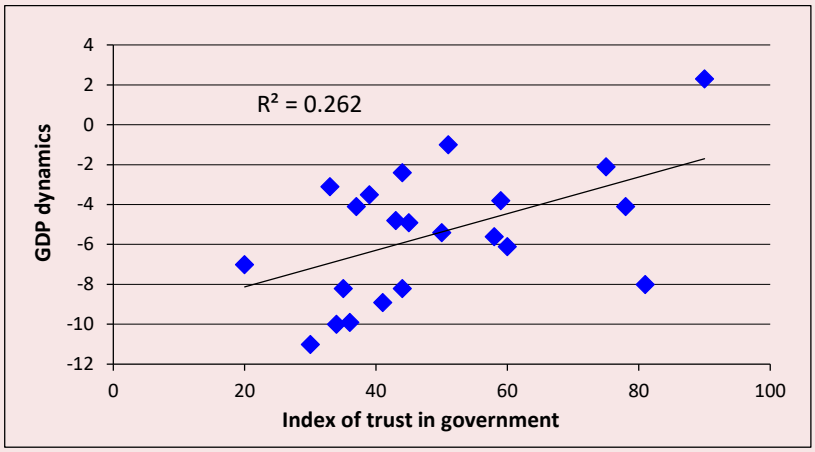
Sources: World Economic Outlook 2021 (April) and COVID-19 Weekly Epidemiological Update 25

Figure 2. GDP growth in 2020 and value added in the service sector, % of GDP in 2019 for 30 countries



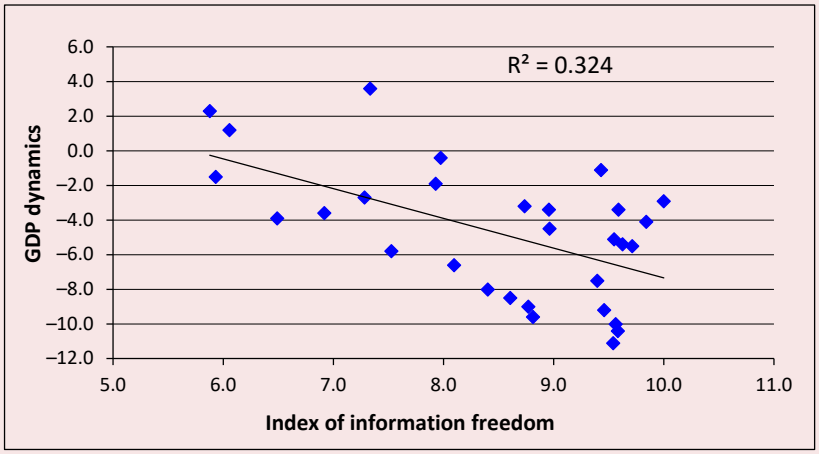
Source: TheGlobalEconomy.com

Figure 3. Relationship between the level of trust in government and the change in GDP in 2020 for 23 countries



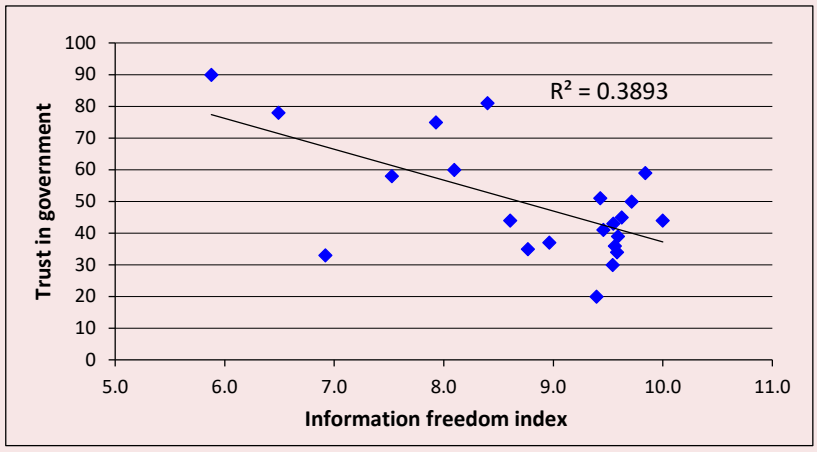
Source: Edelman Trust Barometer 2020

Figure 4. Relationship between the change in GDP and the level of information freedom in 2020 for 30 countries [20]



Source: Vásquez I., McMahon F. *Human Freedom Index 2020. Cato Institute and Fraser Institute.* Available at: https://www.fraserinstitute.org/sites/default/files/human-freedom-index-2020.pdf

Figure 5. Relationship between trust in government and the level of information freedom in 23 countries



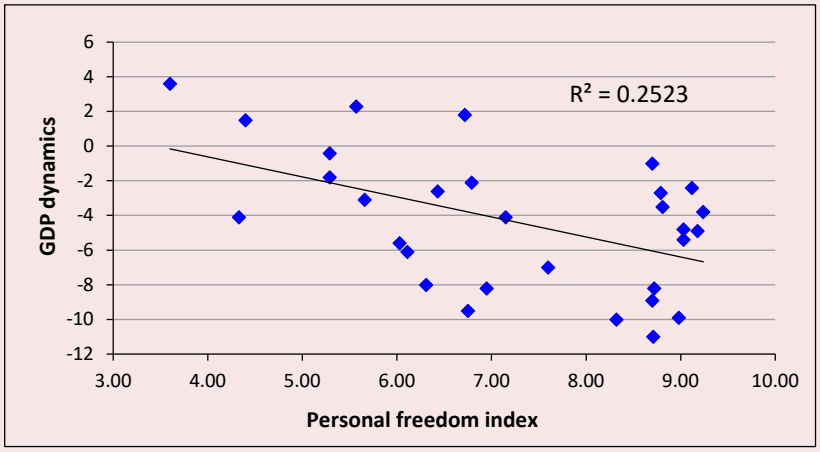
Sources: Vásquez I., McMahon F. *Human Freedom Index 2020. Cato Institute and Fraser Institute.* Available at: https://www.fraserinstitute.org/sites/default/files/human-freedom-index-2020.pdf; 2020 Edelman Trust Barometer

an opponent of the government. However, in the context of the pandemic, such opposition can reduce the effectiveness of government measures to support the economy and contain the spread of COVID-19, which, in turn, affects the dynamics of GDP. Current data for 23 countries show the negative impact of information freedom on trust in government *(Fig. 5)*.

The level of information freedom is used in the formation of a broader index of personal freedom. This index also takes into account the freedoms of movement, religion, assembly, political organizations, and gender freedoms. In the context of the pandemic, there is a negative relationship between the dynamics of GDP and the level of the multicomponent index of personal freedom *(Fig. 6)*.

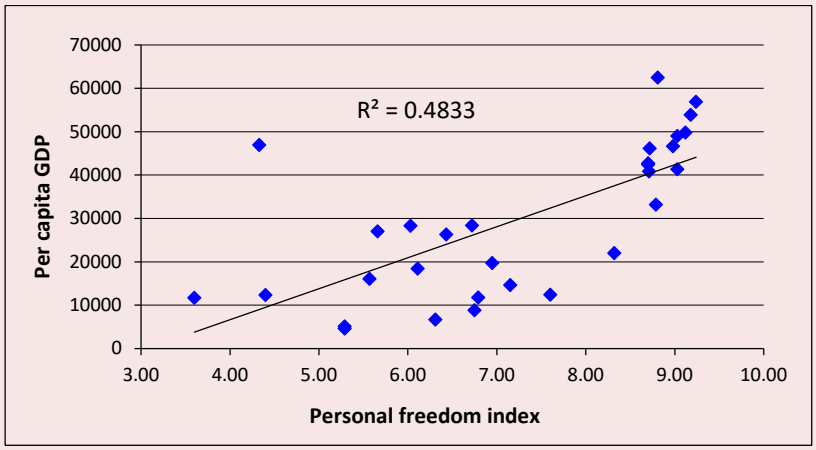
However, there is a positive relationship between the levels of personal freedom and per capita GDP *(Fig. 7)*.

Figure 6. Relationship between the change in GDP and the level of personal freedom in 2020 for 30 countries [20]



Источник: Vásquez I., McMahon F. *Human Freedom Index 2020. Cato Institute and Fraser Institute*. Available at: https://www.fraserinstitute.org/sites/default/files/human-freedom-index-2020.pdf

Figure 7. Relationship between the level of GDP per capita (purchasing power parity) in 2019 and the level of personal freedom in 30 countries



Sources: Vásquez I., McMahon F. *Human Freedom Index 2020. Cato Institute and Fraser Institute*. Available at: https://www.fraserinstitute.org/sites/default/files/human-freedom-index-2020.pdf; TheGlobalEconomy.com

We should note that the data presented in Figure 7 do not reflect causal relationships between the parameters under consideration. In addition, along with differences in the levels of GDP per capita, the content of individual freedom also differs, there is an opportunity to emigrate or an opportunity to travel around the world. It is clear, however, that the temporary restriction of personal freedoms imposed in the context of the pandemic is more disruptive to the usual way of life in rich countries than in less developed countries.

Regression analysis *(Tab. 2)* confirms that almost half of the differences between countries in GDP dynamics under COVID-19 are due to two factors: coronavirus mortality and information freedom. Both result in a weakening of trust in government, which affects the effectiveness of efforts to combat the pandemic.

Table 2. Regression analysis of GDP decline factors in 2020

Variable	Coefficients
Constant	8.687089** (3.962028)
Information freedom	-1.37653*** (0.490736)
COVID-19 mortality	-0.02288** (0.010714)
R^2	0.44

Note. The dependent variable is the change in GDP in 2020. Standard errors are indicated in parentheses. Characters «***», «**» highlight the estimates that are significant at the level of 1 and 5%, respectively.
Source: own calculations for 30 countries.

Conclusion

The real effectiveness of socio-economic systems is tested in the context of black swan events that disrupt the usual course of socio-economic development. The COVID-19 pandemic has proven that not all the world's leading economies have the necessary adaptive qualities. The low level of trust in government plays a role here. Surveys show that even in such highly developed countries as the United States, the Republic of Korea, and Canada, almost half of respondents perceive capitalism in its current form as doing more harm than good. There are much more supporters of this viewpoint in India, Indonesia, China; it also prevails in France, Italy, and Spain [20, p. 66].

In particular, we should note the nature of the relationship between changes in GDP and the death rate from COVID-19. There is no sufficient reason to interpret the decline in GDP growth as a downside to improving the epidemiological situation. The fall in GDP and the high mortality rate from COVID-19 are the result of the countries' unpreparedness to face the increasing scale of challenges. It should be borne in mind that the industrial revolution is also such a challenge.

The experience gained during the COVID-19 pandemic shows that in unforeseen circumstances, the decisive role can be played not so much by the resource potential of the economy, but by its institutional qualities. In order for the socio-economic system to adapt well to an emergency situation, it should make prompt adjustments to the level of centralization of decisions made. For some situations, a rapid response at the local management level is necessary and sufficient. Other emergencies require centralized solutions to mobilize resources across the country. Thus, the Chinese government sent doctors from different provinces in the epicenter of the coronavirus epidemic, the city of Wuhan in Hubei Province[21]. However, it is important that the government enjoys the trust of the population, otherwise it is difficult to count on the effectiveness of government measures, and social activity can become destructive.

Since the pandemic is not yet over, the conclusions presented on cross-country differences in GDP dynamics under the influence of COVID-19 are preliminary, based on data for 2020 alone. In the future, it would be useful to compare the adaptive capacity of countries in terms of the rate of recovery of their economies after the pandemic.

[21] https://regnum.ru/news/society/2887611.htm

References

1. Taleb N.N. *The Black Swan: The Impact of the Highly Improbable*. Random House, 2007. 480 p.
2. Minaev V.A., Faddeev A.O. The issue of slow catastrophes. *Tekhnologii tekhnosfernoi bezopasnosti=Technology of Technosphere Safety,* 2006, no. 2, pp. 32–35. Available at: https://academygps.ru/nauka-5/nauchnye-zhurnaly-i-publikatsii-52/nauchnyy-internet-zhurnal-tekhnologii-tekhnosfernoy-bezopasnosti/vypusk/2006-2027/-2042/ (accessed: February 12, 2021) (in Russian).
3. Mirkin Ya.M. Transformation of the economic and financial structures of the world: the impact of growing shocks of catastrophes. *Kontury global'nykh transformatsii: politika, ekonomika, pravo=Outlines of Global Transformations: Politics, Economics, Law,* 2020, vol. 13, no. 4, pp. 97–116. DOI: https://doi.org/10.23932/2542-0240-2020-13-4-5 (in Russian).
4. Brodeur A., Gray D., Islam A., Bhuiyan S-J. A *Literature review of the economics of COVID-19*. IZA Institute of labor economics. Discussion paper series no 13411. Available at: http://ftp.iza.org/dp13411.pdf (accessed: September 21, 2020).
5. Baniamin H.M., Rahman M., Hasan, M.T. The COVID-19 pandemic: Why are some countries more successful than others? *SSRN Electronic Journal,* 2020. DOI: https://doi.org/10.2139/ssrn.3575251
6. Chaudhry R., Dranitsaris G., Mubashirc T., Bartoszko J., Riazi S. A country level analysis measuring the impact of government actions, country preparedness and socioeconomic factors on COVID-19 mortality and related health outcomes. *EClinicalMedicine*, 2020, no. 25, 100464. DOI: https://doi.org/10.1016/j.eclinm.2020.100464
7. Maor M., Howlett M. Explaining variations in state COVID-19 responses: Psychological, institutional, and strategic factors in governance and public policymaking. *Policy Design and Practice*, 2020, vol. 3, no. 3, pp. 228–241. DOI: 10.1080/25741292.2020.1824379
8. Clarke L., Chess C. Elites and panic: More to feat than fear itself. *Social Forces,* 2008, vol. 87, no. 2, pp. 993–1014. DOI:10.1353/sof.0.0155
9. Acemoglu D., Chernozhukov V., Werning I., Whinston M. D. *A Multi-Risk SIR Model with Optimally Targeted Lockdown*. Working paper no. 27102. National Bureau of Economic Research. Available at: https://doi.org/10.3386/w27102
10. Capano G., Howlett M., Jarvis D., Ramesh M., Goyal N. Mobilizing policy (in) capacity to fight COVID-19: Understanding variations in national responses. *Policy and Society*, 2020, vol. 39, no. 3, pp. 285–308. DOI: 10.1080/14494035.2020.1787628
11. Toshkov D., Yesilkagit K., Carroll B. *Government Capacity, Societal Trust or Party Preferences? What Accounts for the Variety of National Policy Responses to the COVID-19 Pandemic in Europe?* OSF Preprints 7chpu, Center for Open Science, 2020. DOI: 10.31219/osf.io/7chpu
12. Bargain O., Aminjonov U. *Trust and Compliance to Public Health Policies in Times of Covid-19*. 2020. Available at: https://papers.ssrn.com/abstract=3596671
13. Brodeur A., Grigoryeva I., Kattan L. *Stay-at-Home Orders, Social Distancing and Trust*, 2020. Available at: https://papers.ssrn.com/abstract=3602410
14. Barrios J.M., Hochberg Y. *Risk Perception through the Lens of Politics in the Time of the COVID-19 Pandemic. National Bureau of Economic Research*. Working paper no. 27008. DOI: https://doi.org/10.3386/w27008
15. Durante R., Guiso L., Gulino G. *Asocial Capital: Civic Culture and Social Distancing during COVID-19*. 2020. DOI: https://ssrn.com/abstract=3611606
16. Balmford B., Annan J.D., Hargreaves J.C., Altoè M., Bateman I.J. Cross-country comparisons of COVID-19: Policy, politics and the price of life. *Environmental & Resource Economics*, 2020, vol. 76, no. 4, pp. 525–551. DOI: 10.1007/s10640-020-00466-5
17. Smithson M. Data from 45 countries show containing COVID vs saving the economy is a false dichotomy. *The Conversation*, 2020. Available at: https://theconversation.com/data-from-45-countries-show-containing-covid-vs-saving-the-economy-is-a-false-dichotomy-150533 (accessed: December 21, 2020).

18. Sorci G., Faivre B., Morand S. Explaining among-country variation in COVID-19 case mortality rate. *Scientific Reports*, 2020, vol. 10, no. 1, 18909. Available at: https://doi.org/10.1038/s41598-020-75848-2
19. Liang L.-L., Tseng Ch.-H., Ho H.J., Wi Ch-Y. COVID-19 mortality is negatively associated with test number and government effectiveness. *Scientific Reports*, 2020, vol. 10, 12567. DOI: https://doi.org/10.1038/s41598-020-68862-x
20. Vásquez I., McMahon F. *Human Freedom Index 2020. Cato Institute and Fraser Institute*. Available at: https://www.fraserinstitute.org/sites/default/files/human-freedom-index-2020.pdf (accessed: January 19, 2021).

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REVIEWS

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Socio-Economic Studies and Political Aspects of Developing the Northern Region (to the Centenary of the Komi Republic)

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Abstract. In this work, we show the formation and development of socio-economic studies in the northern periphery. The authors reflect the role of economic science and regional management in the development of territories with difficult natural conditions. During the time of capitalist colonization, socialist planned economy, revolutionary reform and the formation of market relations, scientific recommendations, regarding the forms of organizing production and improving the economic mechanism by the authorities, as a rule, were not received properly and on time. Nevertheless, as shown in the article, all scientific concepts and theories, despite a delay, somehow influenced (and are influencing) vital activity of the population of distant regions, but especially it influences the theory of initial capital accumulation, socialist accumulation, mobilization economy, regional organization of productive forces, economic federalism, a variety of forms of ownership and mixed economy, territorial management. Science forms the theoretical basis for objectively determined social transformations, which serves as a reference point for the accelerated development of productive forces and the growth of people's well-being. However, political activity often ends up in completely opposite positions, preferring to break existing economic relations to the detriment of public interests. On the other hand, the very socio-economic reality and various circumstances of life suggest the need to introduce new theoretical propositions into science, corresponding to the cyclical nature of the market economy, the diversity of its forms, and extreme political and economic situations. At the same time, the experience of the formation of economic

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relations in various regions is gaining significant importance that is recommended to consider in the entire problematics of research of the national and world economy.

Key words: economic thought, revolutionary reform, evolutionary preferences, the formation of economic theories, the practice of public administration, the northern periphery, the Komi Republic.

Introduction

The article is prepared due to the centenary of the Komi Republic, and it is devoted to the economic teachings and political doctrines that influenced the development of the Republic as part of the Russian state. The author tried to reveal the impact extent of the well-known economic theories and policies of the Russian governments on life and economy of the northern periphery during the periods of radical transformations and evolutionary development. The historical approach to answering this question allowed seeing some analogies of the past with the present times and to actualize the problems of political and economic relations along the "center – region" line.

The purpose of the study is to show the need for special analytical work on the correspondence (or discrepancy) between the practice of economic transformations and social development theories. Except literature sources, we used annual reports of the Russian Academy of Sciences and the Institute of Socio-Economic and Energy Problems of the North of Komi RC of the RAS Ural Branch.

Scientific justification of Russia's economic development: pre-revolutionary experience and revolutionary alternative

Pre-revolutionary experience

Advanced Russian economic thought of the late 19–early 20th century was mainly focused on the theory of social reform, the problems of transforming agriculture and industrial development, with the justification of a possibility of Russia's entry into the forefront of the world economy. The implementation of ideas that combine social, agricultural, and industrial development was considered possible with various options of political and economic transformations: 1) without changing the foundations of the reformed system; 2) with a gradual change of the foundations; 3) with their rapid and revolutionary transformation. Many Russian authors of social and economic theories relied on the teachings of K. Marx, and some agreed with him about the objective laws of the change of capitalist society to a socialist one [1]. Well-known economists and researchers adhered to a position briefly formulated by P.B. Struve: "In order to get out of our economic squalor ... Russia must become a rich capitalist country from a poor capitalist country" [2, p. 250]. Among practical economists with scientific thinking, such views were shared by N.K. Bunge, S.Yu. Witte, and P.A. Stolypin.

Ideas on social changes in the agrarian field were more fully reflected in the works of A.V. Chayanov, who believed that the peasant labor economy could become stable and multiply due to cooperation in several economic activities (acquisition of technical means, sales of products, agronomic and veterinary services, maintenance of communal land and means of production for collective use, etc.). Land reclamation and land management measures, organization of social funds are the functions of the state. Land, according to A.V. Chayanov, should be nationalized and transferred to the use of peasant farms and rural communities on the condition of progressive taxation [3].

The subject of many studies was industrial and transport development, but the accomplishments of D.I. Mendeleev should be noted first. He made a significant contribution to the scientific justification of the development and deployment of productive forces, including such sectors of the national

economy as oil, coal, iron ore, argued for the idea of coal gasification, proposed the construction of the Volga-Don Canal, established the commercial and industrial significance of the north-eastern border of Asia and Europe, recommended to develop the Northern Sea Route and the Arctic, to irrigate the lands of the Lower Volga region, and to develop river navigation and rail transport, justified the conditions of customs tariffs and protection of Russian industry, raised the question of how to develop the Northern Sea Route and the Arctic, to catch up and even overtake developed capitalist countries [4].

V.I. Lenin thoroughly studied agriculture in relation to the industry as of the second half of the 19th century. He convincingly showed the fallacy of the views of the Narodnik-economists on the limited possibilities of Russian industrial capitalism and the advantages of the economy's rural-communal system. Based on scientific analysis of Zemsky statistics, factory censuses, and numerous literary sources, Lenin proved that, in Russia, there was a social division of labor, the growth of commodity production, social stratification of peasantry, and the formation of the working class, the specialization of regions and interregional exchange, i.e., processes that are quite sufficient for the development of the internal market with expanded social reproduction. Lenin said that economic and geographical zoning and the simultaneous deepening of statistical methods for analyzing mass socio-economic processes is the right way to identify stable trends in the development of capitalist relations in Russia [5].

During the First World War (1914–1918), the Commission for the Study of Natural Productive Forces of Russia (KEPS) was formed in 1915 under the auspices of the Russian Academy of Sciences (RAS) under the chairmanship of Academician V.I. Vernadsky. The foundation for its creation was based on the achievements in the field of not only natural sciences, but also social sciences, as well as the results of complex geographical and statistical characteristics of Russia, carried out under the leadership of P.P. Semenov-Tyan-Shansky. The Commission combined the efforts of scientists of many specialties to assess the country's natural resource potential and to develop measures with the participation of the Russian Academy of Sciences in economic and cultural construction. The concept of placing research institutes in Russian regions was formulated.

Modern analysts of Russian economic thought note some common features of its most prominent representatives: ethical and moral principles of scientific explanation of economic activity, patriotism, and the desire to help the Fatherland, usage of Western teachings, significantly transformed due to Russia's specifics [6].

Revolutionary alternative

The First World War and its devastating consequences strengthened the position of the radical wing of socialists, which was reflected in V.I. Lenin's work "The State and Revolution" (the interpretation of the state as a dictatorship: either bourgeois or working class) [7]. The leading political parties (Social Democrats, Socialist Revolutionaries, Constitutional Democrats, etc.) ignored Plekhanov's thesis that Russia is not ready for radical political transformations, and therefore calls for a socialist revolution imply a break with Marxism, a transition to the positions of anarchists, and a lack of understanding of real conditions of the country's economic development [8].

In 1917–1924, the Soviet government had a surprising split in the assessment and use of achievements of Russian economic thought. One vector of understanding the progressive movement of Russia, indeed, was associated with the ideas of scientific socialism and expressed in completely acceptable political acts for the majority of population (decree on peace, decree on land; decree on the establishment of the state commission for education; decree on freedom of conscience, church and religious societies; basic law on land

socialization; declaration of the rights of Russian peoples, declaration of working and exploited people, etc.). The other one reflected only the ideas of state dictatorship and "war communism" that allegedly did not contradict democracy (the decree on the dissolution of the Constituent Assembly; several documents on the establishment of a state monopoly in politics and social activity; decree on revolutionary tribunals, etc.).

The part of the program documents on the construction of socialism, which concerned the productive forces, basically corresponded to the historical course of scientific and technological progress. It was assumed to use the advantages of a generalized large-scale industry, transport, and energy systems in the formation of efficient production complexes. V.I. Lenin, in the "Outline of the Plan for Scientific and Technical Works" (April 1918), recommended the Supreme Board of the National Economy to instruct the Academy of Sciences, which began a systematic study and survey of Russia's natural productive forces, to form several commissions of specialists for the fastest possible preparation of a plan for the reorganization of industry and economic recovery of the country. This plan, according to V.I. Lenin, should include: "rational placement of industrial facilities in Russia from the point of view of proximity of raw materials and possibility of the least loss of labor during the transition from processing raw materials to all successive stages of processing semi-finished products until the finished product is obtained; rational, from the point of view of the newest largest industry and especially trusts, merging and concentration of production in a few largest enterprises; the greatest provision of the present Russian Soviet Republic (without Ukraine and without the regions occupied by the Germans) for independent supply with all the main types of raw materials and industry" [9, p. 228].

Special attention was paid to the electrification of industry and transport and the use of electricity in agriculture, usage of non-first-class fuels (peat, coal of the worst grades) to produce electric energy with the lowest costs for the extraction and transportation of fuel, application of water forces and wind engines in agriculture.

The listed tasks concerning scientific and technical works were specified in the State Commission for Electrification of Russia (GOELRO plan – 1920). Its district-wide principle of organizing the national economy in the form of production complexes, formed around large state-owned electric power stations, was the basis for a new (constructive) economic geography of Russia in theoretical terms and practical placement of industrial facilities. GOELRO Commission prepared the basis for the creation of a state body for systematic long-term planning. State Planning Committee (Gosplan) was organized in February 1921.

N.D. Kondratiev started the theory of forecasting social development with the scientific justification of its general guidelines. He conducted a statistical study of large (long) cycles and showed the interconnection of economic fluctuations of various durations, associated with the renewal of long-term elements of fixed capital (production facilities, transport, energy, and other infrastructure), with major technical changes, creation of new energy sources, new types of raw materials, and development of fundamentally new technologies [10]. There also were other scientific achievements that correspond to the ideas of the planned organization of economic activity (methods of economic and social statistics, compilation of product and intersectoral balances, mathematical modeling of the state and prospects for the development of the national economy, etc.).

The second vector of economic management in Soviet Russia can be described as "steeply politicized". It was formed on the principle of "the end justifies the means". At the same time, the purpose setting was mostly political: retention

and consolidation of Bolsheviks' power, creation of labor communes as production and social organizations, simulation of aggravation of class struggle, destruction of everything that provokes capitalist relations. It may seem that this was caused only by the confrontation between white and red terror, Civil war, famine, and the weakness of the democratic state in solving the problems of the war economy. In fact, as if bypassing previously created theories of social transformation, a model of the autocratic power vertical, corresponding to the "Asian way of production", began to be purposefully built. Some foreign and domestic analysts have identified it as Eastern despotism, which is characterized by the absence of private property, the abolition of market competition, and an absolute power of the state bureaucracy [11; 12].

It is impossible to deny the influence of extraordinary circumstances on the Soviet government's choice for clearly non-democratic governance. However, it was precisely the principles of "war communism" that corresponded to the ideas of the supreme leadership of Russia about a socialist society (the absence of private ownership of the means of production, elimination of commodity-money relations, equalized distribution of material goods). Moreover, V.I. Lenin began to interpret the country's national economy as a single factory, individual districts as its workshops, and this is not yet an extreme case of economic thought about socialist construction. Ideas and principles of "war communism" determined the essence of the general line of the party; the new economic policy (NEP) was only a temporary departure from it (it existed in the USSR from 1921 to 1929).

There were conditions when politics predetermined the content of economic science. If someone did not justify the chosen course of building "socialism", showed a real picture of public life, or revealed processes that did not correspond to political directives, then he put his life in mortal danger. So, A.V. Chayanov in 1937 and N.D. Kondratyev in 1938 were executed by firing squad. The former – for respecting peasantry and its freedom, including the choice of forms of rural cooperation. The latter – not for the theory of large cycles as a progressive technological sequence, but for its social interpretation, which does not coincide with the "theory" of the transition from socialism to communism. It is impossible to combine these two vectors of building a socialist economy with the help of science, so political and social aspects of collectivization, industrialization, cultural revolution, and the promotion of productive forces to the East and North were not considered outside official interpretations.

Projection of Russian economic thought and revolutionary doctrines on the northern periphery

V.I. Lenin in his work "On Food Tax..." (April 1921) wrote: "Look at the map of the RSFSR. There are vast expanses that would fit dozens of huge cultural states: to the north of Vologda, to the southeast of Rostov-on-Don and from Saratov. to the south of Orenburg and from Omsk, to the north of Tomsk. All these territories are dominated by patriarchal, semi-savagery and the most real savagery. What about the peasant backwoods of the rest of Russia? Everywhere with dozens of versts of country roads – or rather, dozens of versts of off-road roads – that separate the countryside from the railways, that is, from the material connection with culture, with capitalism, with large-scale industry, with a city. Does not patriarchalism, oblomovism (sluggishness and apathy), and semi-savagery prevail everywhere in these places?" [13, p. 228].

We citied this quote to partially disagree with it at first. As for economic backwardness, the reality is exactly as it is written by V.I. Lenin. However, "savagery and semi-savagery" is a characteristic of people themselves living on the outskirts of the Russian Empire, and this characteristic did not correspond to reality. For example, Komi and Pomors were better in terms of national average

literacy; they were not inferior in the level of organization of peasant farms and latrines[1]. The Pomors gave the country M.V. Lomonosov, and the Komi – P.A. Sorokin.

Educated people in the Komi Republic knew about socio-economic science and its achievements. This knowledge was formed during training in Moscow, Petrograd, and other cities of central Russia, during communication with exiled revolutionaries. Economic science penetrated the Komi Republic together with the organizers of expeditions to collect statistical and other information to assess the possibilities of colonization of new lands and connect natural resources to the national economy. So, for the 1901–1914 period, 11 state expeditions were organized. Some of them, like the Komi public figures V.F. Popov and K.F. Zhakov,actively participated in it and organized scientific stationary statistical observations. They smartly approached the assessment of P.A. Stolypin's policy on the resettlement (colonization) of peasants from central Russia to Siberia and to the North. "K.F. Zhakov concluded that it was impossible to colonize the Komi Region widely, since this would lead to the destruction of forests, disappearance of fish, animals, and fowl, as well as general decline of the region, and he did not see any free lands for colonization. K.F. Zhakov and V.F. Popov opposed the allocation of land for immigrants, defended the expediency of conducting land management of local old-resident population, allocating them free arable and other land" [14, p. 164].

Local cells of social democrats, social revolutionaries, and cadets supported propaganda of their political beliefs with certain social works and attitudes of political leaders. However, after the revolution of 1917, this diversity was replaced by political monopoly of the Bolshevik party and the forms of organization of Soviet power corresponding to its ideas.

The quote about the backwoods expanses is also cited to remind the reader of Lenin's assessment of the economic structures of Russia at the beginning of the 20th century. V.I. Lenin wrote in 1921: "... what exactly are the elements of various socio-economic structures existing in Russia. This is the whole point of the question. Let us list these elements: 1) patriarchal, i.e., largely natural, peasant economy; 2) small-scale commodity production (this includes most of the peasants who sell bread); 3) private-economic capitalism; 4) state capitalism; 5) socialism" [13, p. 207].

In some regions of Russia, these elements were presented differently. In the North, natural and small-scale peasant farming prevailed, in some places – private-economic capitalism, and therefore social transformations should have been based primarily on the theory of A.V. Chayanov and some other agricultural economists, including V.I. Lenin (if we keep in mind his works "The Development of Capitalism in Russia" and "On Food Tax"). The ideas of complete collectivization here did not correspond to the real situation in the agricultural sphere[2]. The nature of the peasant labor economy and the family-labor theory were excluded from the

[1] Latrine craft is temporary, most often seasonal work of peasants in the Russian Empire outside the place of permanent residence. People who went to work were called "otkhodniks". Such a trade among the Komi women was sewing.

[2] A unique historical material on "dekulakization" is presented in the appendix to the newspaper "Respublika" (Komi) "Smoke of the Fatherland" for January 26, 2013. This is the act of inventory of the property of Andrey E. Markov, drawn up on February 22, 1930 (the village of Chernutevo, Udorsky district, Komi Oblast). The inventory contains 191 items for a total amount of 2880 rubles and 20 kopecks. The land is not listed in the inventory. At modern prices (without land) – this is about 2 million rubles. M.A. Evseev was considered an ordinary peasant. The author of a comment to the inventory Anna Sivkova writes: "This document leads to many conclusions and conclusions. Perhaps one of the most important of them: peasant labor in private farms before the revolution, even in the north, provided prosperity. This inviolability of rural life was undermined by the looting of the farms of such housewives and hard workers as Andrey E. Markov from the Udor settlement of Chernutevo".

field of view of the Soviet government as a possible socially fair and economically effective source of socialist accumulation.

The economy of the Komi Autonomous Region as part of the Russian Federation, and then the USSR, in the 1920s and 1930s was studied within the framework of the theoretical concept of the initial socialist accumulation, first, at the expense of income from foreign trade activities, and then by non-equivalent inclusion of the natural resources of the marginal territories in the country's manufacturing industry. The European North had become a gold and foreign exchange shop, supplying roundwood abroad through the Arkhangelsk port. The Russian government received gold and foreign currency for this. In the GOELRO Plan, the European North was considered a reserve, the potential of which had to be thoroughly studied. One of the most striking examples of scientific and organizational work on the complex study of the northern territories is the expedition to the Komi region under the leadership of Academician A.P. Karpinsky, President of the USSR Academy of Sciences ("Pechora Brigade", 1933).

At present, there is a complete overview of the results of the work of the Pechora Brigade, which allows us to understand the scope, nature, and results of its activities. It includes the monograph by M.P. Roshchevsky, L.P. Roshchevskaya, and A.A. Brovina, which is not only of historical value for science itself and the Russian Academy of Sciences (celebrating its 300th anniversary in 2024) but is also a source for understanding the mutual relationship between socio-economic theories and political practice [15]. This work clearly traces the theme of the double vector of social transformations in Russia (the USSR) in the first half of the 20th century: scientifically based development and distribution of productive forces and the formation of a social system with elements of political oppression devoid of any scientific basis (except for the theory of the "Asian way of production").

On the one hand, the natural resource potential of the Ukhto-Pechersk region was studied according to all scientific rules, there was a desire to find an economically and socially acceptable way to use it for the benefit of people. On the other hand, even working conditions of the brigade, not to mention practical experience of mineral resources development that it studied in Chibyu, Water fishing, Yareg, Vorkuta, and other places, are characterized in its reporting documents by the words OGPU, GULAG, political prisoners, special settlers, barracks, supervision, etc.

Scientific orientation of the North to the selective development of resources (construction of the enterprises that are economically necessary and cannot be built in other areas; creation of a focal northern industry with high mechanization and reduction of the cost of live labor) was not used in practice precisely because of the availability of cheap forced labor.

Scientific support of the administrative-planned economy

Mobilization economy

The book of the Chairman of the USSR State Planning Committee (1938–1949), Academician N.A. Voznesensky "Military Economy of the USSR during the Patriotic War" [16] reflects the greatest feat of the Soviet people in the victory over fascism, primarily due to the mobilization of high human qualities and willingness to sacrifice for the sake of saving the Motherland, relatives, and friends. It is difficult to judge whether this kind of human nature was formed despite the economic dictates of "war communism", but, of course, historical memory of the origins of the Fatherland and examples of its heroic defense played an important role.

This book is about the economy during the war. At the same time, N.A. Voznesensky believed that the military economy can also exist in peacetime, when the tasks of creating a defense complex and other conditions for national security become paramount. It is noteworthy that the

military economy was built according to certain rules of expanded social reproduction using the balance sheets of the national economy and, what is especially important for economic geography, it implemented the political doctrine of a significant and short-term shift of productive forces to the East.

As a result, we can say that the military economy strengthened the mobilization thinking, natural for the entire Soviet period, with a political and patriotic tinge of overcoming difficulties, inevitability of long endurance, denudation of the central Russia' countryside, and, most importantly, the belief that this way of organizing the economy and the "artel-barrack" way of life reflects the advantage of socialism over capitalism.

From a scientific point of view, the mobilization economy can be interpreted as a way to solve complex economic problems. It encourages the development of methods of system analysis and the creation of programs of increased complexity. An example of this is the work of academic commissions on the mobilization of resources for the defense needs [17]. Especially the activities of the commission for the Urals, Western Siberia, and Kazakhstan. The programs and projects of the commission, agreed among themselves on the terms of execution, material, technical and financial support, were implemented according to the rules of scientifically based program management[3]. Perhaps only the oil and gas development program in Western Siberia came close to such a high level of development and implementation of national economic programs in peacetime.

Economic science and socialist planning

The most general understanding of planning is the choice of a goal and methods to achieve it. Based on numerous scientific works on economic planning and personal experience in the development of territorial planning concepts, we note that this type of activity is immanent in humans and social systems; it is useful not so much for predicting the future, but for building a chain of logical conclusions about progress and problems that arise in its path.

Initially, the problem is recorded explicitly (for example, how best to cut the plywood to get the desired workpieces with the least waste). Then it is complicated by the issues of rational use of equipment, working time, and the replacement of some resources with others. This is how the theory of optimal planning emerged in relation to enterprises and factories [18].

The content of state planning depends on the understanding of the essence of the state itself, its social functions. The theorists of socialist planning proceeded from the stereotype of the state as a comprehensive body of public administration (the management of society, not general-purpose affairs) that had developed in the USSR [19]. If, for example, in the United States and Western countries, economic science interpreted the development of intersectoral balances as a method of understanding the production and financial proportions to correctly determine the vector of economic development, in the USSR, where this area of scientific research reached a world level,

[3] "During its work in Sverdlovsk, the Commission has achieved outstanding results in many areas of activity: the accelerated development of the oil industry in the Urals and the Volga Region, the discovery and start of industrial development of bauxite deposits in the east of the Urals, new deposits of iron ore in Kuzbass, and molybdenum ores in Kazakhstan. If the developed reserves of ore raw materials as of January 1, 1941 are taken as 100%, then, as of January 1, 1945 they were: for iron ores — 140%, manganese – 200%, chromite – 140%, quartzite – 300%. By the end of the war, power plants in the Urals gave electricity by one and a half times more than before the war. Among other achievements of scientists who worked in the commission: metallurgical enterprises of Magnitogorsk and Kuznetsk mastered the technology of melting armored steel in the main open-hearth furnaces, which made it possible to produce an additional 350 thousand tons of armored steel in 1942–1944; introduction of coke substitutes into production, which allowed to significantly reduce the transportation of coke by rail; new technologies for the production of aluminum, cobalt, chromium; new ways to obtain high-quality motor fuel from high-sulfur Bashkir and Ural oils". Source: Fighters of the academic front. How Soviet science moved to the military rails. Available at: https://www.kommersant.ru/doc/4566203 (accessed: March 27, 2021).

intersectoral balance from a practical point of view was considered as the plan itself or, in any case, as its framework.

The political-economic interpretation of planning emphasized the advantages of socialism: the absence of economic crises, wasteful competition, and contradictions between the social nature of production and the private mode of appropriation. At the same time, since the 1970s, the signs of the USSR lagging behind the developed countries in terms of labor productivity and the quality of life of the population have become increasingly noticeable. Economists-researchers, who were focused not on justifying political economy, but on finding ways to update the economic mechanism, concluded the increasing importance of economic independence of enterprises and regions, economic calculation, and economic incentives for labor [20–24].

An interesting fact is that the authors of the economic and mathematical field were the first to write about this, who knew about the possibilities of computer technology to calculate planned tasks "from the plane to the nail", but nevertheless stated that the socialist economy should function based on commodity-money relations. This position, to some extent, corresponded to the goal of reforms of the Chairman of the USSR government A.N. Kosygin.

The views of many geographers-economists shifted from the resource and energy-technological factors of production placement, which were strictly set by plans to the analysis of relatively free (variant) conditions for the formation of territorial social systems [25–27]. The actualization of social, cultural, and ethnic aspects of life has strengthened the natural-historical approach to explaining the processes of population settlement in contrast to the policy of its voluntary resettlement. This shift was also caused by the fact that the economic and geographical reinforcement of the "territorial section" of socialist planning did not receive a proper response in management structures or was carried out in an exaggerated form, as happened with the sovnarkhoz organization or the division of territories into zones of activity of industrial and agricultural regional committees of the CPSU.

Hope for a correct understanding of the role of socio-economic geography in planning and management flickered with the inclusion of information about territorial production complexes (TPC) in the materials of party congresses. However, the joy was premature: 12–15 selected TPCs did not correspond to the specified principles and teachings; they embodied the meaning of the mobilization economy, when new growth points were needed to save the decaying industry. The situation was corrected by the theory of program targeted TPC, which showed ways to implement large investment projects together with natural and social conditions of areas of concentrated construction [28].

Scientific support of the administrative-planned economy in the Komi Republic

Since the beginning of the 1950s, transmission of Soviet scientific and economic thought to the Republic of Komi began to be carried out through the Komi branch of the USSR Academy of Sciences in Syktyvkar, which also includes the Department of Economics. Then this kind of broadcast was supplemented with in-depth studies of the economic efficiency of economic measures. At the same time, the practice of the Northern socio-economic policy was critically studied.

Economic thinking, combined with geographical and ecological thinking, "suggested" orientation to limited opportunities for the development of natural resources despite political demands for production growth at any cost; to possibility of forming territorial production complexes in the North and in the Arctic, but only as local systems with a developed interregional commodity exchange. The Timan-Pechora TPC, created according to the logic of ministerial self-sufficiency, eventually became only an additional line of five-year plans, losing the essence of

territorial integration. Economists and geographers drew the attention of the country's political leadership to the fact that the promotion of industry in the northern latitudes requires special scientific and technical training and advanced development of industrial and social infrastructure, otherwise a sacrificial economy with a significant use of forced labor again arises [29; 30].

The economic assessment of the northern conditions in the justification of the five-year plans was carried out with significant errors. Thus, the estimated cost of constructed objects in the republic, in comparison with similar ones in the Moscow Oblast, increased by 1.34 times. An expert assessment with a scientifically based approach to the analysis of natural and economic-geographical conditions showed that 1.43–2.25 times price increase existed for certain territories of the Republic [31]. In practice, this discrepancy was shown by the lack of financial resources at the end of the five-year plan and the presence of large volumes of unfinished construction.

However, the paradox was that the lack of balance in the overall planning of the national economy in 1960–1980 led to unprecedented growth of the economy of the Komi Republic. However, the economic assessment of the depletion of natural resource capital at that time was not yet given, and statistical indicators, such as total social product, gross national income, nominal value of monetary income, etc., did not reflect the realities of regional development.

Economic science and revolutionary reform

Approaching reforms

In the late 1980s, Russia's economic science underwent significant changes that are considered revolutionary [32]. Indeed, at that time, economics laid the theoretical foundations for new relations about property, institutionalism, system of optimal economic functioning, structural proportions of social reproduction, economic motivation of productive labor, and social priorities in the planning system. If we paraphrase the earlier statement of P.B. Struve, we can figuratively formulate the main credo of Russian economic thought in the late 1980s: "To get out of our economic squalor ... Russia must change to a rich socialist country from a poor socialist country".

At the same time, these achievements of Russian economic science should be supplemented with research on the theory and methodology of reform as a specific management process. But such studies were not organized properly. The Congress of People's Deputies of the USSR, as the highest body of state power (1989–1991), did not receive knowledge from the social sciences about the procedure for carrying out reforms. It is difficult to say whether it would have helped the progressive development of our country's economy or not, since the subsequent reform did not require scientific knowledge.

Revolutionary reformation

The term "rev-reforms" was introduced by V.N. Leksin and N.A. Shvetsov; they also concluded that economic transformations carried out in the Russian Federation in the 1990s were not reforms from a scientific point of view [33]. Economic transformations involving self-financing planning, state order, economic standards, direct economic relationsб and wholesale trade, equilibrium prices, self-financing-guaranteed system of distribution of the wage fund, program and regulatory financing, self-financing credit system, contractual management structure were designated by E.G. Yasin as "radical reforms" [34]. At the same time, "shock therapy" with a simultaneous introduction of free prices, voucher and collateral privatization, depreciation of bank deposits of population, legal speculation in the foreign exchange market, barter, economic banditry "under the roof of the state", exorbitant social stratification of citizens, etc. are difficult to define by any scientific term. The government and business ignored the calls of academic science

for a moral economy. The state itself aimed at complete destruction of everything socialist, and it is interpreted as the collapse of the ideas of the reformers even by Western authors [35].

The Komi Republic: reaction to deter revolutionary reform

We assess the economic behavior of regional governments in 1992–2000 as a period of the formation of local countermeasures that opposed the actions of the Center in terms of the revolutionary reform of the political and economic system of Russia. Many regional leaders, in contrast to the federal ones, were more inclined to consistent and gradual changes. Within the regional economy and socio-economic geography, this position was supported by a scientific analysis of the problems of the formation of regional property, the system of territorial management, and geographical expertise of management decisions [36]. Based on the materials of a long-term observation of the households in the Komi Republic, the reaction of ordinary people to the "reforms", carried out in the country, was shown: transition to small-scale production, social isolation, psychology of survival, and loss of hope to get out of poverty [37].

The laws of the Komi Republic, adopted in the 1990s, which protected the interests of population and focused on the rational use of natural resources, did not have a mechanism for use; in this regard, territorial and intersectoral development programs were more effective. The key was the Program of socio-economic development of the Komi Republic with its administration as a special management body. However, implementation of the programs, along with the positive effect, exacerbated the problem of the spatial gap between created and consumed surplus product, since the management of the programs was mainly extraterritorial, and the norms and rules of classical economic federalism were not applied in the regional policy of the Russian Federation. Constitutional norms on local self-government, regarding an independent solution of several tasks related to life support of population, also did not have a constructive form of implementation. All this was subjected to scientific criticism, but without a positive response from the state administration. Regional and local government structures were forced to work in the "manual control" mode.

Economic science and evolutionary development

Evolutionary thinking

Since 2000, transition from revolutionary reform to the policy of evolutionary development has been marked. Evolutionary orientation contributed to the emergence of a new hypothesis of the integration society, which is defined by the ideas of economic sociodynamics, mixed economy and social clusterism, philosophy of cooperation, evolutionary theory in connection with reproduction regimes, and others that reflect the global trends of inclusion of factors of society's sustainable development in the system of state and interstate management.

Evolutionary thinking "draws" an ideal image of the future and the corresponding methods of achieving its goals, but it constantly conflicts with current undesirable circumstances. Economic science and the practice of public administration are forced to move from the traditional analysis and rational use of development factors (science, technology, labor, territorial division of labor, needs and interests, etc.) to the analysis of circumstances (natural and man-made accidents and catastrophes, epidemics, market cataclysms, geopolitical instability, social tension, etc.). In such circumstances, regional and federal governments often use the "manual control".

There is a situation when the "circumstances of the way of action" become one of the main subjects of socio-economic research. It also turned out that the evolutionary economy is difficult to combine with previously formed and, in fact, unchanged

political and economic base, in which "...the orientation of monetary authorities to serve the interests of currency and financial speculators and the offshore oligarchy daily increases the contradictions between the ruling elite and people, making them antagonistic" [38, p.24].

Differences between macro -, meso -, and microeconomics

The author believes that the idea of the role of the regional economy as a science in the system of state and municipal administration will be more correct if its subject is the organization of territorial management – activities related to the formation and rational use of municipal and sub-federal property, as well as inter-economic and interregional cooperation [39]. This clarification is relevant to the topic of our article, since it emphasizes the belonging of other socio-economic sciences to the formation of regional policy. Moreover, the regional economy is not a link between enterprises (firms) and national economy. The study of regions and other territorial and economic systems initially takes place on an interdisciplinary basis. The translation of macroeconomic indicators to the regional level remains the prerogative of macroeconomics itself. It is also important that some processes that are studied by macroeconomics and the economy of firms are not captured at the regional level. This circumstance should be kept in mind when scientific recommendations are made to state and municipal management on behalf of the regional economy.

Science and its interest in strong regional power

With the hope for political stability, considering understanding of the increasing role of the subjects of the Russian Federation in state administration, the Commission for the Study of the Natural Productive Forces of the Komi Republic was formed in 2000 under the chairmanship of Academician N.P. Yushkin. Its main task was to identify scientific, technical, and socio-economic problems, general directions for long-term development and deployment of productive forces, and integrated use of mineral, fuel and energy, water, forest, and other resources, considering environmental factor in the Komi Republic and adjacent regions. Involuntarily, there were analogies with the all-Russian KEPS of 1915 and the borrowing of its forms of activity. The published works and scientific and analytical materials of the RK KEPS have significantly increased the importance of socio-economic research in making specific decisions of the government of the Republic. There was an element that strengthened its self-sufficiency, which was noticed by the federal government. At the end of 2004, the commission de jure ceased to exist.

The example of the RK KEPS is only a special case of a general contradictory situation in relations between the Center and the regions. Let us pay attention to a possibility of a new aspect in the interpretation of these contradictions. Under the current circumstances, in the field of economic federalism, all significant, and even insignificant, issues are resolved by regional governments in Moscow, and therefore socio-economic research in the regions has also begun to be conducted with a Moscow orientation: if the scientific result is perceived by the central structures of state administration, then the likelihood of its practical application on the ground increases. Of course, the scientific space is formed on top of administrative and territorial borders, so the procedure for implementing the results of research does not necessarily have to take place on the principles of "shuttle diplomacy" between the Center and the regions.

At the same time, the procedure of "joint management" is mandatory in terms of solving the most urgent problems of the transformation of territorial and economic systems caused by extreme and complex conditions for their further functioning.

In the Komi Republic, an example is the current situation with the Arctic cities of Vorkuta and Inta, where the coal industry is losing its city-forming

mission. In determining the prospects for their unstable development, the logic of the mobilization economy can be useful, when any directions for their preservation should be considered with an eye to the risks of Arctic life activity. We believe that it is possible that the resettlement program from Vorkuta and Inta will have to be carried out unconditionally and in the evacuation mode. Economic tasks related to national security, the development of urgently needed mineral resources and the study of the Arctic should be solved with the use of a shift method of work and the use of high-availability block modules for the construction of unique Arctic bases.

The prospects for the development of territorial and economic systems of the taiga part of the Republic are determined by the optimization of the formation and reproduction of their human and natural resource potential, practical application of "green economy" principles, reconstruction of rural settlement based on the strengthening of supporting settlements and relocation of residents of unpromising villages, change in the configuration of land use, new spatial organization of infrastructure and social services. The solution of these tasks involves a significant reallocation of financial resources in favor of regions and municipalities.

These examples reflect three aspects of socio-economic research conducted in the Komi Republic: 1) analysis of trends in the North in terms of population, environmental management, formation of economic systems and mechanisms for regulating socio-economic processes; 2) determination of value and significance of individual indicators (characteristics) of the northern regions in the development of the regional, national, and world economy. Demographic, natural resource, and environmental potentials, ethnic culture and traditional economy, socio-economic space (peripheral, sparse, difficult to overcome), climatic discomfort and other natural conditions of life are evaluated; 3) development of recommendations in the field of strategic planning and programming of economic systems development based on northern (Arctic) production and social technologies [40].

Conclusion

The author's idea is to show the role of socio-economic research in the development of the Komi Republic while the collection of analytical material and compilation of the text of the article was implemented with some additions when referring to the problems of "science and power". First, let us pay attention to consequences that arise if theoretical research is not considered or implemented in an exaggerated form. Thus, by 1917, Russian economic science had formed a kind of theoretical basis for objectively determined social transformations, which served as a reference point for the accelerated development of Russia's productive forces and the growth of people's well-being. The same basis was formed in the pre-reform period by 1992, when the key idea was to carry out socio-economic transformations without revolutionary restructuring of the existing socio-political system. However, the political reality turned out to be completely opposite, anti-popular. This situation allows us to make three recommendations:

1) criticism of the existing and creation of an image of the future should be accompanied by the development of an appropriate theory of reform as a management process;

2) planning is subjected not only to the material and technical part of the productive forces, but also to an adequate socio-economic mechanism of their action, improvement of social relations within the framework of universal values and concepts;

3) revolutionary reform of the economy associated with the struggle for political power through "shock therapy" is outside the scope of socio-economic research; it does not need scientific justification and is only covered by the significance of selectively taken economic theories, such as the regulatory role of the free market and monetarism

or is carried out with the false idea of not adhering to any economic theory.

Evolutionary path of development (gradual and long-term movement toward an integrated society of social justice) is more rational, but its implementation is associated with various negative circumstances. This leads to the adjustment of the classical topic of socio-economic research in two ways:

1) inclusion of circumstances in the subject content of the economy;

2) understanding the essence of the mobilization economy, since the mobilization economic thinking arises and develops not only in wartime, but also in peacetime due to emergency circumstances or when the country's political leadership sets ambitious tasks that are impossible to solve within the objectively established proportions of social reproduction and limited investment resources

Appeal of socio-economic sciences to regional topics is caused by the great importance of specifics in the adjustment of the entire national economy. From the experience of studying the Komi Republic, it follows that:

1) inclusion of the Russian periphery in the general system of economic and cultural transformations can be fruitful only if the way of local life becomes the most important subject of science and management practice;

2) general economic theory and regional practice of economic activity may develop in parallel for some time. However, there comes a time when it is necessary to carry out an examination of scientific knowledge and practical experience of management for their compliance with actual socio-economic situation of specific regions. A possibility of a significant restructuring of economic thinking under the influence of local practices is not excluded.

References

1. *Russkie ekonomisty* (XIX – nachalo XX veka) [Russian Economists (19th – early 20th Century)]. Moscow: IE RAS, 1998. 275 p.
2. Struve P.B. *Kriticheskie zametki k voprosu ob ekonomicheskom razvitii Rossii* [Critical Notes on the Economic Development of Russia]. Saint-Petersburg: Lenand, 1894. 304 p.
3. Chayanov A.V. *Krest'yanskoe hozyaistvo: izbrannye trudy* [Peasant Economy: Selected Works]. Ed. by L.I. Abalkin et al. Moscow: Ekonomika, 1989. 492 p.
4. Mendeleev D.I. *Problemy ekonomicheskogo razvitiya Rossii* [Problems of Russia's Economic Development]. Moscow: Sotsekgiz, 1960. 615 p.
5. Lenin V.I. Razvitie kapitalizma v Rossii [Development of Capitalism in Russia]. In: Lenin V.I. *Poln. sobr. soch*. [Complete Collection of Works]. Vol. 3. 792 p.
6. *Akademiki-Ekonomisty Rossii* [Academic Economists of Russia]. Moscow: IE RAS, 1999. 281 p.
7. Lenin V.I. Gosudarstvo i revolutsiya [The State and Revolution]. In: Lenin V.I. *Poln. sobr. soch*. [Complete Collection of Works]. Vol. 33. 486 p.
8. Beiron S.G. *Plehanov, utopizm i rossiiskaya revoljutsiya* [Plekhanov, Utopianism and the Russian Revolution]. Available at: http://russiabgu.narod.ru/pages/themes/txt/beiron_plehanov.pdf (accessed: March 27, 2021).
9. Lenin V.I. Nabrosok plana nauchno-tehnicheskih rabot [Outline of the Plan for Scientific and Technical Works]. In: Lenin V.I. *Poln. sobr. soch*. [Complete Collection of Works]. Vol. 36. Pp. 228–231 (in Russian).
10. Kondratiev N.D. *Problemy ekonomicheskoi dinamiki* [Problems of Economic Dynamics]. Moscow: Ekonomika, 1989. 526 p.
11. Wittfogel K.A. *Oriental Despotism: A Comparative Study of Total Power*. New Haven: Yale University Press, 1957. 556 p.

12. Nureev R.M. Asian way of production and socialism. *Voprosy Ekonomiki=Economic Issues*, 1990, no. 3, pp. 47–58 (in Russian).
13. Lenin V.I. *O prodovol'stvennom naloge (znachenie novoi politiki i ee usloviya)* [On Food Tax (Meaning of the New Policy and its Conditions]. In: Lenin V.I. *Poln. sobr. soch*. [Complete Collection of Works]. Vol. 43. Pp. 205–245 (in Russian).
14. *Istoriya Komi s drevneishih vremen do kontsa XX veka* [The History of Komi from Ancient Times to the late 20th Century]. Syktyvkar: Komi knizhnoe izdatel'stvo, 2004. Vol. 1, 560 p.; Vol. 2, 704 p.
15. Roshchevsky M.P., Roshchevskaya L.P., Brovina A.A. *Pechorskaya brigada akademika A.P. Karpinskogo* [Pechora Brigade of Academician A.P. Karpinsky]. Syktyvkar, 2015. 646 p. (Komi Research Center of the Ural Branch of RAS).
16. Voznesensky N.A. *Voennaya ekonomika SSSR v period Otechestvennoi voiny* [The Military Economy of the USSR during the Patriotic War]. Moscow: Gospolitizdat, 1948. 192 p.
17. Alexandrova T.D. Variety of geographic works in the first years of the Great Patriotic War. *Izvestiya RAN. Seriya Geograficheskaya=RAS Proceedings. Geographical series*, 2011, no. 3, pp. 100–109 (in Russian).
18. Kontarovich L.V. *Ekonomicheskii raschet nailuchshego ispol'zovaniya resursov* [Economic Calculation of the Best Use of Resources]. Moscow: AS USSR Publ., 1960. 348 p.
19. Sorokin G.M. *Planirovanie narodnogo hozyaistva SSSR* [Planning of the National Economy of the USSR]. Moscow: Izd. Soc.-ekonom. lit., 1961. 458 p.
20. Nemchinov V.S. Socialist economic management and production planning. *Kommunist=Communist*, no. 5, 1964, pp. 74–87 (in Russian).
21. Fedorenko N.P. *O razrabotke sistemy optimal'nogo funktsionirovaniya ekonomiki* [On the Development of the System of Optimal Functioning of the Economy]. Moscow: Nauka, 1968. 243 p.
22. Kossov V., Pugachev V. Multi-stage system of optimization calculations of prospective national economic plans. *Planovoe hozyaistvo=Planned economy*, 1974, no. 10, pp. 12–20 (in Russian).
23. Valovoi D.V. *Ekonomika: vzglyady raznyh let (stanovlenie, razvitie i perestroika hozyaistvennogo mehanizma)* [Economics: Views of Different Years (Formation, Development and Restructuring of the Economic Mechanism)]. Moscow: Nauka, 1989. 454 p.
24. May B.A. *V poiskah planomernosti: iz istorii razvitiya sovetskoi ekonomicheskoi mysli kontsa 30-h – nachala 60-h gg.* [Searching for Planning: From the History of the Development of Soviet Economic Thought in the Late 30s-early 60s]. Moscow: Nauka, 1990. 160 p.
25. Saushkin Yu.G. *Ekonomicheskaya geografiya: istoriya, teoriya, metody, praktika* [Economic Geography: History, Theory, Methods, Practice]. Moscow: Mysl,1973. 559 p.
26. Khorev B.S. *Territorial'naya organizatsiya obschestva (aktual'nye problemy regional'nogo upravleniya i planirovaniya v SSSR)* [Territorial Organization of Society (Actual Problems of Regional Management and Planning in the USSR)]. Moscow: Mysl, 1981. 320 p.
27. Dmitrievskii Yu.D. *Ocherki sotsial'no-ekonomicheskoi geografii. Razvitie i problemy* [Essays on Socio-Economic Geography. Development and Problems]. Leningrad: Nauka, 1990. 163 p.
28. Bandman M.K. *Territorial'no-proizvodstvennye kompleksy: teoriya i praktika predplanovyh issledovanii* [Territorial Production Complexes: Theory and Practice of Pre-Planned Research]. Novosibirsk: Nauka, 1980. 256 p.
29. Slavin S.V. *Osvoenie Severa Sovetskogo Soyuza* [Development of the North of the Soviet Union]. Moscow: Nauka, 1982. 207 p.
30. Agranat G.A. Opportunities and realities of the development of the North: Global lessons. *Itogi nauki i tehniki. Ser. "Teoreticheskie i obshhie voprosy geografii"=Results of Science and Technology. Ser. "Theoretical and General Questions of Geography",* 1992, no. 10, 188 p. (in Russian).
31. Dmitrieva T.E. Issues of geographical expertise of the regulatory framework for economic development of the territory. *Priroda i regional'naya ekonomika. Syktyvkar=Nature and Regional Economy. Syktyvkar*, 1985, pp. 14–28. (Komi Branch of AS USSR) (in Russian).

32. Makasheva N.A. *Ekonomicheskaya nauka v Rossii v period transformatsii (konets 1980-h-1990-e gody): revolyutsiya i rost nauchnogo znaniya* [Economic Science in Russia in the Period of Transformation (Late 1980s – 1990s): Revolution and Growth of Scientific Knowledge]. Pp. 12–32. Available at: ekonomicheskaya-nauka-v-rossii-v-period-transformatsii-konets-1980-h-1990-e-gody-revolyutsiya-i-rost-nauchnogo-znaniya.pdf (accessed: March 17, 2021) (in Russian).
33. Leksin V.N., Shvetsov A.N. Reformation processes in the life of society: Conditions of successful organization and the reasons for failures. *Sistemnye issledovaniya. Metodologicheskie problemy. Ezhegodnik 1995–1996* [System Studies. Methodological Problems. Yearbook 1995–1996]. Ed. by D.M. Gvishiani. Moscow: Editorial URSS, 1996. Pp. 7–40 (in Russian).
34. Yasin E.G. *Hozyaistvennye sistemy i radikal'naya reforma* [Economic Systems and Radical Reform]. Moscow: Ekonomika, 1989. 319 p.
35. Zwaynert J. *When Ideas Fall. Economic Thought, the Failure of Transition and the Rise of Institutional Instability in Post-Soviet Russia*. N.Y.; L.: Routledge, 2018. 138 p.
36. Lazhentsev V.N., Dmitrieva T.E. *Geografiya i praktika territorial'nogo hozyaistvovaniya* [Geography and Practice of Territorial Management]. Yekaterinburg: Nauka, 1993. 137 p.
37. *Na puti k rynochnoi ekonomike: sotsial'naya praktika regional'nogo razvitiya* [On the Way to a Market Economy: Social Practice of Regional Development]. Syktyvkar, 2003. 208 p.
38. Ilyin V.A. *Effektivnost' gosudarstvennogo upravleniya: tochka zreniya glavnogo redaktora* [Efficiency of Public Administration: Editor-in-Chief's Point of View]. Vologda: Institute of Socio-Economic Development of Territories of RAS, 2015. 320 p.
39. Lazhentsev V.N. Household as an object of research in the system of social sciences. *Zhurnal ekonomicheskoi teorii=Journal of Economic Theory*, 2017, no. 3, pp. 11–22 (in Russian).
40. Lazhentsev V.N. Directions of research at the Institute of socio-economic and energy problems of the North of the Komi Science Centre, Ural Branch, RAS. *Izvestiya Komi NC UrO RAN=Proceedings of the Komi Science Centre of the Ural Division of the Russian Academy of Sciences*, 2018, no. 4, pp. 102–110 (in Russian).

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Investment Activity in the Russian Economy: Activation Problems and Directions*

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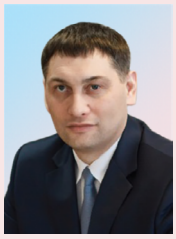

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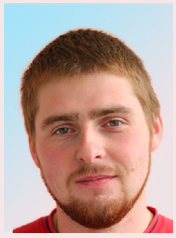

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Abstract. The big challenges facing Russia require ensuring high-quality economic growth which makes it necessary to search for investment resources. However, financial crises, foreign policy pressure, coupled with the export-raw materials model of the Russian economy, do not allow achieving necessary growth investment rates in fixed assets. The purpose of the research is to find and scientifically substantiate ways to enhance investment activity in the Russian Federation. For this purpose, the authors have evaluated parameters of investment activity, have analyzed the sources of financial resources for investment, and have developed specific recommendations to increase investment activity in the Russian economy. The results of the study revealed a number of problems: strengthening of sectoral and territorial disparities, growing dependence on imports of investment goods, deterioration of technological development parameters, reduction of the share of Research and Development and Research and Technological Development in GDP, and reduction of debt financing opportunities. As ways to boost investment activity, the authors propose monetary policy adjustments, expansion of fiscal and tax incentives to support investment and RTD, and development of value chains aimed at smoothing resource allocation imbalances including investment ones. The scientific novelty of the research is in development applied directions for increasing investment activity in the modern Russian economy. The methodological basis is the theory of social reproduction and national accounting. The information base of the research consists of statistical data and materials of the Federal State Statistics Service, the Unified Interdepartmental Information and Statistical Service, input-output tables, the Bank of Russia, the Higher School of Economics, normative legal acts and program documents of the Russian Federation and its subjects, publications of Russian and foreign authors in various periodicals, monographs. Further scientific research will be related to the study of institutional factors of investment activity activation and forecasting the results of implementing the proposed recommendations.

Key words: economics, investments in fixed assets, problems, activation, monetary policy, fiscal policy, Research and Technological Development, value chains.

Introduction

In modern dynamically changing geopolitical and geo-economic environment, the Russian Federation faces many big challenges: technological and digital transformation of the national economy, deterioration of climatic and environmental conditions, depletion of natural resources, ensuring food and energy security, and development of the Arctic territories[1]. Their overcoming requires strengthening the Russian economy and ensuring positive economic dynamics.

One of the key factors of economic growth is investment. The Presidential Decree of the Russian Federation no. 474, dated July 21, 2020 "On the National Development Goals of the Russian Federation for the period through to 2030" sets the task of increasing the investments volume in fixed assets and achieving real capital investment growth by at least 70% by 2030 compared to the indicator of 2020 (i.e. by 5.5% annually).

Over the past decade, it was possible to achieve such growth rates of investment activity only in 2010, 2011, and 2012. The average annual growth rate in 2009–2020 was 0.6%. There are a lot of problems in the investment sector. As a result, the amount of fixed capital accumulation in the Russian economy is insufficient to meet the challenges[2].

[1] On the strategy of scientific and technological development of the Russian federation: Presidential Decree of the Russian Federation no. 642, dated December 1, 2016.

[2] In 2005–2019, the accumulation rate of fixed capital did not exceed 22.3% of GDP which is an extremely low value for a developing economy that sets itself the task of implementing large-scale transformations. For reference: according to the World Bank, the average global savings rate in 2019 was 24.4%, in the USA it was 21%, Japan – 24.3%, India – 30.2%, China – 43.8%.

At the same time, the COVID-19 pandemic and related restrictions exacerbate the situation: according to a survey conducted by the Institute for National Economic Forecast of RAS in the spring of 2020, 37.2% of respondents reported a complete stop of investment activity after the beginning of the crisis caused by the coronavirus pandemic, and 31.4% reported a partial stop [1].

With this in mind, the purpose of the research is to find and scientifically substantiate ways to activate investment activity in the Russian Federation. To achieve this purpose, the authors have solved the following tasks: assessment of the dynamic and structural parameters of investment activity in the Russian Federation; analysis of sources of financial resources for investment; development of directions for increasing investment activity in the Russian economy and specific measures within them.

Theoretical foundations of the research

Capital accumulation has been considered as one of the key sources of economic growth since the time of A. Smith. Even then, the transformation of savings into investments, and then into production funds intended for the "maintenance of productive labor" [2], acted as a driver for activating industrial activity. The Harrod-Domar model [3; 4] (based on the idea of an accelerator of the investment process) and the R. Solow model of economic growth [5] (with an exogenous rate of population growth and technological progress and an endogenous savings rate) which have become classical, essentially contained the same assumptions about the key role of savings and investment to expanse production. Numerous models of endogenous economic growth developed later (Uzawa-Lucas, Romer, Grossman-Hellman, Aghion-Howitt, etc.), which took into account the possibility of the influence of economic policy on the rates of economic growth in the long term, expanded the definition of capital, dividing it into human and physical, and described in detail the optimal accumulation trajectories depending on the presence or absence of returns on scale [6–11].

The importance of ensuring the proper level of capital accumulation in the Russian economy was justified by leading domestic economists. A.G. Aganbegyan in his works showed that economic growth in Russia depends on investment by 80% [12; 13]. V.V. Ivanter concluded that acceptable economic growth (4–5% per year) can be achieved with a fixed capital accumulation rate of 25–28% [14]. V.P. Obolensky and I.A. Kvashnina believed that the domestic economy failed to recover after the collapse of the USSR largely due to chronic underinvestment [15]. Due to the lack of capital investments, the overcoming of crisis situations in the economy is significantly slowing down, which is due to the lack of funds for updating production capacities. Due to the raw material nature of the Russian economy, since the transition to a market-based management system, sectoral disparities have arisen in the direction of the raw materials sector and the manufacturing industry of the initial stages [16]. The spatial development of post-Soviet Russia is characterized by a number of stable trends that have formed an extremely disproportionate distribution of population, income, and resources across the country's regions [17]. I.A. Budanov noted that the country's leadership and Russian society see an urgent need to increase investment activity [18].

At the national level, there are high risks of conducting investment activities [19]. The institutions created by the state to support investment activities do not cope well with their functions [20]. There is an acute problem of returnable offshore investments which is a consequence of the leakage of Russian capital abroad and its subsequent investment in the Russian economy which deprives it of income from these funds [21]. At the same time, the low investment attractiveness of Russian regions negatively affects both the presence of domestic investors and the volume of attracted foreign investments [22]. As V.V. Ivanter noted, the acceleration of economic growth dynamics including in the investment sphere has structural imbalances caused by the destruction

of technological chains due to the export-raw material model of the Russian economy which are not eliminated by traditional market mechanisms [15]. These problems confirm the relevance of the study which contains the search for additional ways to activate investment activity in the Russian Federation.

Methodological aspects of the research

The methodological basis of the research is the theories of social reproduction and national accounting presented in the works of domestic and foreign economic scientists, as well as official documents and materials. In the course of the work, the authors use tabular and graphical visualization techniques of the analyzed data.

The information base of the research is made up of statistical data and materials of the Federal State Statistics Service, the Unified Interdepartmental Information and Statistical Service (EMISS), the input-output tables, the Bank of Russia, the Higher School of Economics, regulatory legal acts and program documents of the Russian Federation and its entities, publications of Russian and foreign authors in various periodicals, monographs.

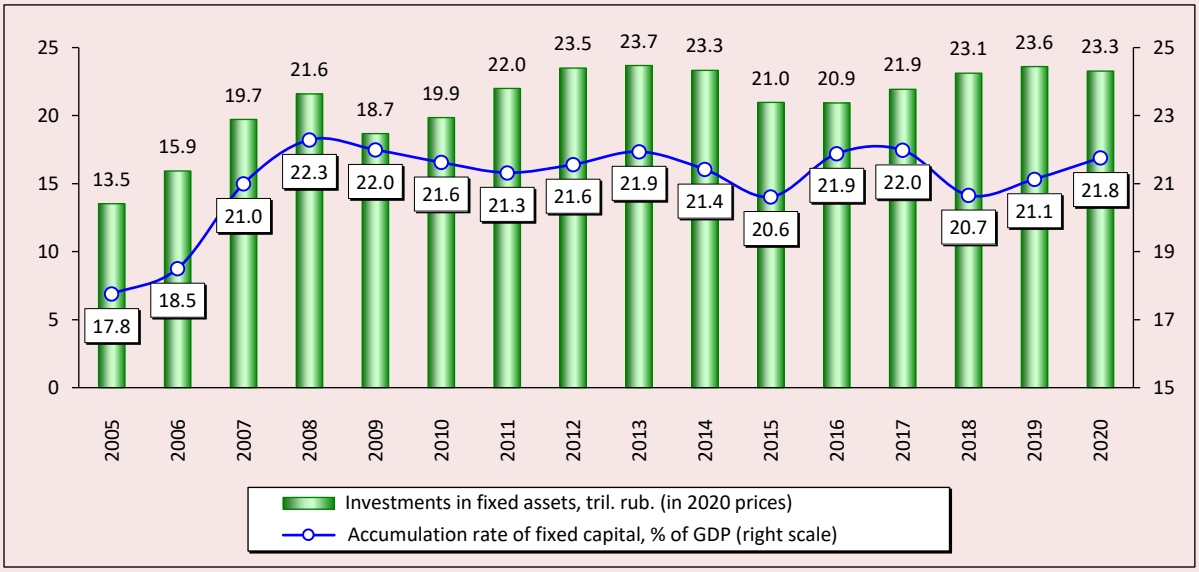
Research results

Investment activity trends in the Russian economy

From 2005 to 2020, the volume of investments in fixed assets in the Russian economy increased by almost 73% *(Fig. 1)*. The average annual growth rate during this period was 3.7%, while the main contribution was made in 2005–2008, while in 2009–2020 the volume of investments was increased by only 8%, and the accumulation rate of fixed capital did not exceed 22% (which is inferior to the level of developing countries conducting active technological modernization). The investment activity dynamics was significantly negatively affected by the crises in 2008–2009, 2014–2015 and 2020 which caused a slowdown in the world economy and deterioration in the foreign economic situation which limited access to foreign investment and capital markets.

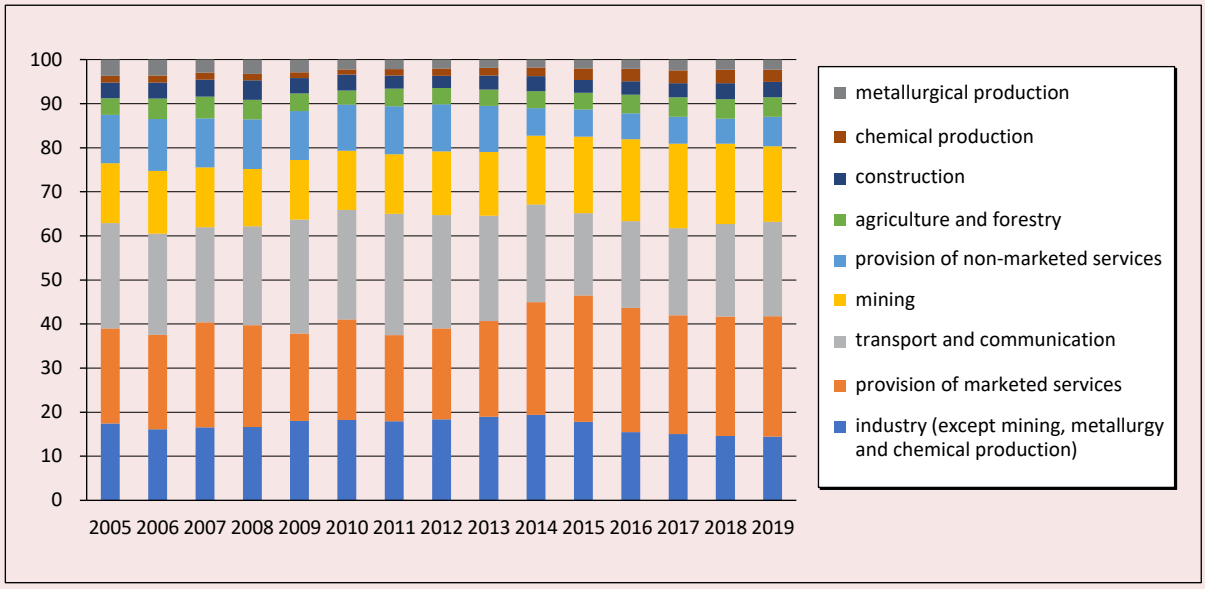
Investigating the causes of these trends, we will consider some structural parameters of the investment process. The analysis of sectoral and territorial proportions allows identifying its structural problems. For instance, due to the raw material

Figure 1. Investment activity dynamics in the Russian economy



Source: authors' calculations based on Rosstat data.

Figure 2. Structure of investments in fixed assets by enlarge economic sectors in 2005–2019, % of the total



Note: The market services sector includes such types of economic activities as wholesale and retail trade, hotels and restaurants, transport services, postal and telecommunications services, financial intermediation, insurance, real estate transactions, rental and provision of services. The non-market services sector consists of state administration and military security, social insurance, education, healthcare and provision of social services, provision of other communal, social and personal services.

Source: authors' calculations based on Rosstat data.

nature of the Russian economy, since the transition to a market-based management system, sectoral disparities have arisen in the direction of the extractive and manufacturing industries of low processing. This reduced the opportunities for other industries to access investment resources, formed the problem of capital outflow from the Russian economy and further exposed existing problems both in the investment process and the national economy as a whole *(Fig. 2)*. Infrastructure services for the raw materials sector require a huge flow of investment, as evidenced by the significant share of transport and communications in the structure of capital investments. In recent years, there has been no leveling of the existing disparities in the sectoral structure of the investment process. Due to these shortcomings, there is an investment shortage within the manufacturing industries. Most of the oil and gas revenues remain inside the fuel and energy complex, activating investment activities in it and increasing its attractiveness for investors. This has a negative impact on the state of the process of forming capital investments within the manufacturing industry, which in turn has a negative impact on the volumes of goods shipped. Such structural imbalances slow down the processes of technological modernization of the economy, increase dependence on imports, reduce the opportunities for digitalization and grow the share of high-tech industry.

The imbalance in the sectoral distribution of capital investments is confirmed by the low rate of accumulation of industrial capital[3]. For instance, the volume of investments in fixed assets for 2019 reached a value of 19.3 trillion rubles. At the same time, the total volume of fixed assets put into operation in the manufacturing industry was

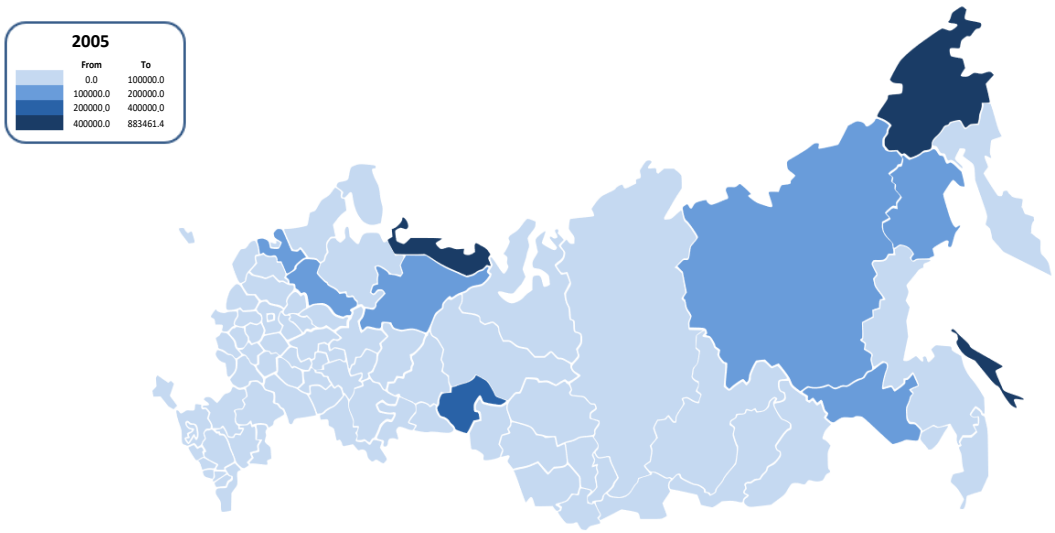
[3] An indicator showing the share of updated fixed assets of industrial enterprises in GDP (source: Uskova T.V., Lukin E.V. *Economic Growth: the Essence, Factors, Ways of Acceleration: Study Aid*. Vologda: FSBIS VolRC RAS, 2018. 140 p.)

equal to 2.2 trillion rubles, i.e. the accumulation rate of industrial capital was only 2% of GDP. For comparison, in the US economy, the value of this indicator in 2018 exceeded 15%.

Separately, it is worth noting the high growth rates of the share of the market services sector in the investment structure which are due to a number of reasons: the presence of unsatisfied demand for these services due to the abrupt transition to a market economy, their high profitability, active digitalization of its industries, high investment attractiveness for the banking sector and foreign capital. The flow of investment into the market services sector makes it difficult to solve the problem of lack of investment in industry.

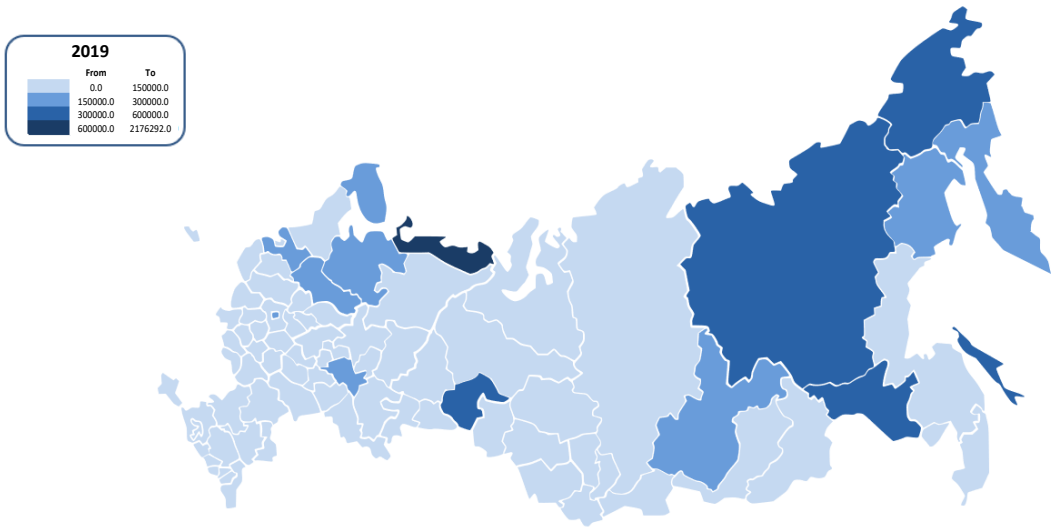
The formed sectoral imbalances caused the appearance of territorial disparities in the investment process. Due to a number of stable trends in Russia's socio-economic development in the post-Soviet period, the spatial distribution of resources,

Figure 3. Per capita investment in fixed assets in 2005, rubles



Source: authors' calculations based on Rosstat data.

Figure 4. Per capita investment in fixed assets in 2019, rubles



Source: authors' calculations based on Rosstat data.

population, gross income produced and used, and, as a result, investments in fixed assets is characterized by significant unevenness. The spatial structure of investments is traditionally dominated by Moscow, the Tyumen Oblast with autonomous districts, and other regions that received income from commodity exports *(Fig. 3, 4)*. The long-term attempts of the federal authorities to reduce the interregional differentiation level by smoothing the indicators of budget security of the entities of the Russian Federation make it possible to equalize the indicators of the social sphere in certain regions, but they do not solve the problem of growing imbalances in the territories' economic development.

Against the background of slowdown in investment activity in the Russian economy and reduction in incentives for increasing production volume of investment products, loss of the material and technical base of investment engineering continues. This is evidenced by the negative dynamics of production and capacity utilization for many types of such products *(Tab. 1)*.

Table 1. Production of certain types of products and utilization of production capacities in the Russian mechanical engineering

Products	Indicator	2005	2010	2015	2019.	2019 to 2005, %
Alternator, MW	P	1,034	9,920	4,446	974	94.1
	UC	-	-	-	-	-
Excavators, units	P	3,565	2,121	1,417	2,745	77.0
	UC	39	28	12	34	-5
Cargo vehicle, thou. units	P	205	155	128	156	75,9
	UC	48	31	34	48	0
Crane trucks, units	P	4,400	2,912	2,066	2,969	67.5
	UC	58	43	31	44	-14
Harvester thresher, units	P	7,479	4,295	4,412	4,820	64.4
	UC	35	30	40	37	2
Gas turbines, except for turbojet and turboprop engines, thou. kWe	P	1,205	2,063	1,274	704	58.4
	UC	40	54	40	26	-14
Incandescent, gas-discharge, arc lamps, mil units	P	-	584	345	293	50.2
	UC	-	54	62	53	-2
Electric motor, thou. units	P	-	2,567	1,423	1,227	47.8
	UC	-	46	33	30	-16
Bulldozers, units	P	1,774	911	577	744	41.9
	UC	61	32	17	30	-31
Oil tank car, thou. units	P	8,3	12.3	2.3	4	29.2
	UC	-	-	-	-	-
Tractor grain drill (with no fertilizer drill), units	P	6,500	2,530	2,052	1,553	23.9
	UC	40	14	24	37	-3
Buses, thou. units	P	78.2	40.9	36.4	16	20.6
	UC	73	29	34	22	-50
Trolleybuses, units	P	812	406	62	74	9.1
	UC	24	12	6	0	-24
Looms, units	P	95	5	42	7	7.4
	UC	-	-	-	-	-
Water steam turbines and steam turbines, mil. kWe	P	24	4.2	1.8	1.0	4.1
	UC	26	41	20	6	-20

Symbols: P – production volume, UC – level of use of the average annual production capacity.
Source: data of the Unified Interdepartmental Statistical Information System.

Table 2. R&D and RTD indicators in the Russian economy

Indicator	2005	2010	2015	2016	2017	2018	2019	2019 to 2005, %	For reference: level for 2018		
									China	USA	Germany
Share of domestic R&D expenditures, % of GDP	1.07	1.13	1.1	1.1	1.11	0.98	1.03	0.96	2.2	2.83	3.13
Research organizations, units	2,115	1,840	1,708	1,673	1,577	1,574	1,618	0.77	-	-	-
Number of personnel engaged in research and development, people per 10 thou. people	64	59	57	51	50	49	49	0.77	56	92*	158

Note: due to the difference in the classification of organizations, comparisons by their number are difficult.
* Data for the USA are given by the number of researchers.
Sources: Rosstat data; Gokhberg L.M., Ditkovskii K.A., Evnevich E.I. et al. *Science Indicators: 2020: Stat. Coll*. Moscow: NRU HSE, 2020. 336 p.

In our opinion, it is difficult to implement technological development (i.e., based on modern high-tech technologies) without restoring the load and commissioning of new capacities of the machine-building complex. In the meantime, the practiced profit-taking at the stage of extraction of raw materials and production of semi-finished products leads to a depression in the production of final products, degradation of the sphere of machine production means. Domestic demand for fundamental and applied science, R&D and RTD is decreasing, the volume of expenditures on science is declining, and the number of research organizations and the number of their personnel is reducing *(Tab. 2)*. In addition, Russia is lagging behind the industrially developed countries in scientific, technological and innovative development and commodity production volume of high-tech sectors of the real economy. The dependence on technology imports has reached critical values[4]. According to the latest available tables of resources and use of goods and services for 2018, the share of imports in a number of strategic industries exceeds 50%, while in the production of machin ery and equipment it is more than 60%, in the production of computers and electrical equipment – 60%, light industry – more than 65%, automotive industry – 40%, pharmaceutical and medical industry – 55%. All other things being equal, the dynamic growth of imports contributes to creation of competitive environment, but the high share of imports in the volume of investments in machinery, equipment and vehicles increases the dependence of the domestic market on changes in foreign economic conditions.

In general, the main trends of the investment activity development in the Russian economy in the study period include:

– slowdown in growth rate of investment volumes and rate stagnation of fixed capital accumulation;

– strengthening of sectoral and territorial disparity in distribution of investments which causes a lack of capital investment in certain types of economic activity in the regions, insufficient saturation of key industries with investments;

– decline in domestic production of investment products and increase in dependence on imports;

– deterioration of technological development parameters, share reduction of R&D and RTD costs in GDP.

Financial resources of the investment process

In the structure of financing sources, there is a smooth transition from the prevalence of attracted funds (a decrease in their share from 55% in 2005 to 45% in 2019) to the predominance of own funds

[4] In September 2014, the Government of the Russian Federation has approved the "Plan for promoting import substitution in industry" which contains 22 sectoral import substitution plans. According to experts, most of the indicators could not be achieved. Available at: https://tagilcity.ru/news/economy/06-11-2018/importozameschenie-v-rossii-chto-poluchilos-za-pyat-let

Table 3. Structure of financing sources of the investment process, % of the total

Element	2005	2010	2015	2019	Change, 2005–2019, p. p.
Own funds	44.5	41.0	50.2	55.0	10.5
Attracted funds	55.5	59.0	49.8	45.0	-10.5
Bank loans	8.1	9.0	8.1	9.8	1.7
Borrowed funds of other organizations	5.9	6.1	6.7	4.8	-1.1
Budget funds	20.4	19.5	18.3	16.2	-4.2
Federal budget funds	7.0	10.0	11.3	7.6	0.6
Budget funds of Russia's entities	12.3	8.2	5.7	7.4	-4.9
Local budget funds	-	-	1.3	1.2	-
Funds of the state extra-budgetary foundations	0.5	0.3	0.3	0.2	-0.3
Funds of organizations and population for shared-equity construction	3.8	2.2	3.2	4.3	0.5
Other	16.8	21.9	12.1	9.3	-7.5
Source: authors' calculations based on Rosstat data.					

(respectively, an increase from 45 to 55% of the total; *Tab. 3*). The reasons for such redistribution may be a reduction in access to foreign markets of investment resources due to geopolitical pressure, decrease in the budget revenue due to unstable energy prices and floating exchange rate of the national currency, high cost of credit resources.

Structure transformation is caused by significant changes in the ratio of attracted sources, primarily by a slowdown in the growth rate of budget investments. The reasons for this are the reduction of investment costs and the transfer of a number of powers for financing investments to the regional level, where there are significantly fewer opportunities to support investment activities.

Dependence of the enterprises' investment activity on their own funds leads to a significant vulnerability for making capital investments during crises (which is confirmed by the official statistics presented above). This is due, among other things, to the imperfection of the monetary policy implemented by the state as a result of which the cyclical problems are characteristic of the real economic sector:

– a significant tax burden does not give enterprises the opportunity to direct their own funds to investments in fixed assets and RTD which does not allow modernizing the production base;

– high rates on commercial loans reduce the possibility of replenishing financial resources to compensate for the fiscal burden and investment;

– decrease in the volume of capital investments significantly slows down the pace of renewal and modernization of the production and technological base;

– weak production base causes the production of products that are not competitive enough on world markets which leads to a reduction in demand for it;

– decrease in the number and volume of orders causes insufficient capacity utilization;

– reduction in output, strong positions of foreign manufacturers and low investment attractiveness of the domestic industry are the reasons for receiving an insignificant amount of revenue.

As a result, enterprises face the question of external financing which is actually unavailable for the following reasons:

– the problem of access to budget investments that do not directly support non-state investors, but mostly form the conditions for creating private investment projects (infrastructure investments);

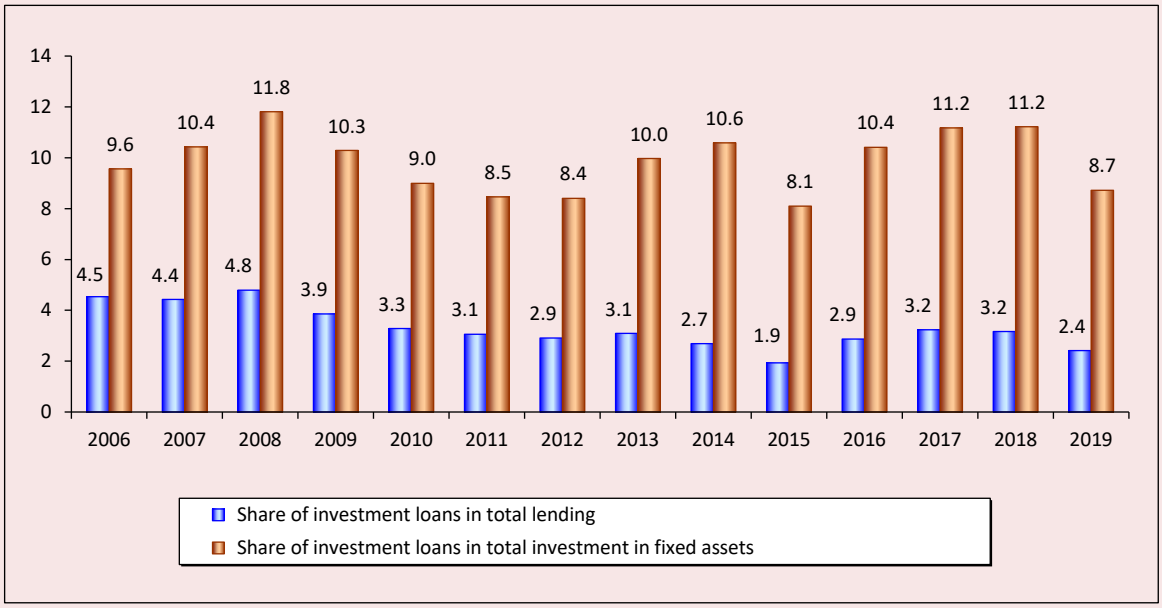
– bank capital is very expensive for enterprises in an unstable economic situation, so there are high risks when making capital investments at the expense of loans.

We should note that the structure of investments is fundamentally different abroad. In developing countries, for example in China, a significant part of investments is carried out at the expense of public funds. In developed countries, investment loans are used primarily which account for 70–80% of the external financing volume. Consequently, the role of attracted funds in investments in fixed assets is great [23]. As A.G. Aganbegyan noted, one of the main issues of monetary policy in the field of investment is the formation of a mechanism for involving the banking sector in the investment process, and it is lending that should become a priority source of financing for capital investments [12].

The existing credit market in Russia, with a significant saturation of assets, is not interested in financing investment projects, focusing on issuing consumer loans due to their greater profitability and short turnaround time, as well as significant investment risks on the part of both lenders and borrowers. At the same time, the structural parameters of investment lending are only getting worse. For example, the share of long-term loans for non-financial organizations in the total volume of lending has been decreasing in recent years, but the share of the banking sector in financing the investment process remains approximately within the same limits *(Fig. 5)*. This creates a problem of underfunding the economy due to the accumulation of significant funds in the financial sector.

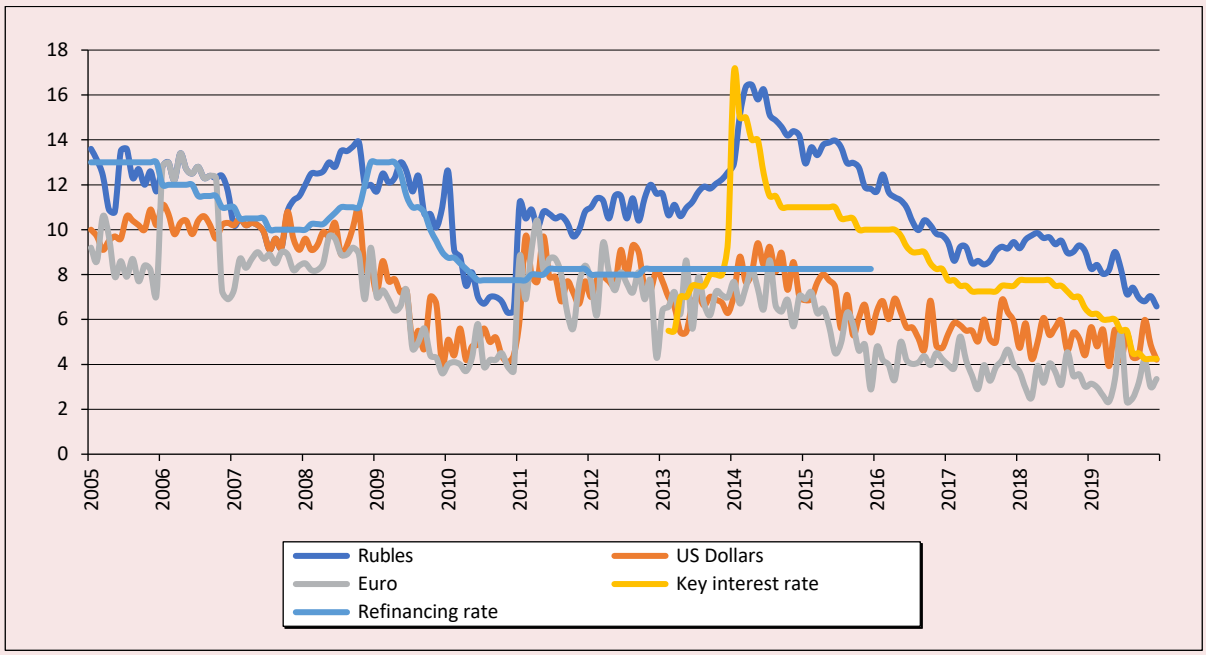
It is also necessary to note the high cost of debt financing. Despite the gradual reduction of the key rate since 2014, the price of credit for enterprises is still very high *(Fig. 6)*. For comparison, the real lending rate abroad is significantly lower which allows increasing the financing volume of enterprises' investment projects at the expense of credit institutions: according to the World Bank, the real interest rate in Japan is 1.6%, Italy – 1.9%, the United States – 3.3%, and in Russia it is 4.8% (2019 data).

Figure 5. Structural indicators of investment lending to the Russian economy for 2006–2019, % of the total



Source: authors' calculations based on data of the Bank of Russia.

Figure 6. Weighted average interest rates on investment loans granted to non-financial organizations, %



Note: By the instruction of the Bank of Russia no. 3894-U, dated December 11, 2015 "On the refinancing rate of the Bank of Russia and the key rate of the Bank of Russia", the refinancing rate is equated to the key one. Data on weighted average rates on long-term loans have been available only since 2011.

Source: authors' calculations based on data of the Bank of Russia.

It is worth noting that the banking system resources as a whole carry a significant potential for stimulating the investment process, but high credit rates are a significant barrier to the infusion of financial resources into the real economic sector. Administrative and regulatory measures are necessary to stimulate the flow of bank capital into fixed capital investments. This can give an additional increase in investment which is necessary to increase the rate and time of accumulation.

In general, according to the results of studying the sources of financial resources of investment activity, we have identified the following problems:

– dependence of enterprises' capital investments on their own investment funds which creates a threat to conducting investment activities in an uncertain economic situation and requires changing the structure of sources of financial resources;

– lack of budget financing of investments that are the engine for attracting private capital through the implementation of infrastructure projects;

– existence of a number of barriers to increasing the share of bank investment credit in the structure of investment sources: high rates, banks' disinterest in long-term lending, unstable business conditions that increase risks for both enterprises and credit institutions.

Adjustment directions of the state investment policy

In our opinion, the implementation of a number of state policy measures in the following areas will contribute to solving the problems of investment

activity and providing the Russian economy with investment resources identified by the results of the analysis.

1. Adjustment of monetary policy.

The activation of investment activity requires changes in the current monetary policy, in particular:

1) The use of a targeted credit issue of federal loan bonds to increase the volume of money supply in the economy which will expand the access of economic entities to financial resources for investment. For example, the US Federal Reserve System used the issued funds to implement a bond loan of the Ministry of Finance aimed at implementing large infrastructure projects.

2) The refusal of the Bank of Russia from the inflation targeting regime which significantly slows down investment activity and the transition to the regime of maintaining economic growth for which it is advisable to reduce the amount of funds attracted for deposits of the Bank of Russia and the purchase of its securities.

3) Gradual reduction of the key rate of the Bank of Russia to 0.5% which will contribute to a greater demand for an investment loan which will become the main source of capital investment for enterprises. As S.Y. Glaz'ev notes, "The main financing source for capital investments in the development of all countries that have performed an economic miracle was and remains the target credit issue" [24].

4) Reducing the volume of investments in foreign assets and directing these funds to the Russian economy on the basis of changes in the net international investment position (NIIP) as a source of investment resources which will ensure that the accumulation rate is maintained at the level of 30–35% for three years. This is especially important in the conditions of constant foreign policy and foreign economic pressure on the Russian Federation, as assets can be blocked at any time. According to the scientists of the Institute of Economics and Industrial Engineering, Siberian Branch of RAS, the funds from equating the NIIP to zero are enough to provide the Russian economy with investments at the level of 30–35% of GDP for three years [25].

We should add that alignment of the investment process with the use of monetary policy instruments will require efforts not only from the Bank of Russia, but also from the Ministry of Finance, legislative institutions, and tax authorities.

2. Expansion of budget and tax benefits to support investment activities and RTD.

Fiscal policy improvement in the field of investment and RTD contributes to stimulating the growth of capital investment and increasing the accumulation rate. Introduction of a package of additional fiscal measures aimed at stimulating investment and RTD spending will not only overcome the long-term stagnation processes in the Russian economy, but also increase the budget system stability due to the growth of the tax base for future periods. The proposed set of activities is as follows:

– to create a special tax regime for enterprises designing and producing high-tech products including those formed and operating within the framework of the National Technology Initiative[5]. It will make it possible to increase the attractiveness of venture projects by reducing a number of investment risks and to enter the Russian market to a larger number of private investors;

– to expand the benefits within the "patent window" by removing the fiscal burden from enterprises in the form of income tax, stimulating the growth of innovation and investment activity by increasing RTD profitability;

[5] The National Technological Initiative is an association of business representatives and expert communities to develop promising technological markets and industries in Russia that can become the basis of the world economy. See: On implementation of the national technological initiative: Government Decree of the Russian Federation no. 317, dated April 18, 2016. Available at: https://nti2035.ru/documents/docs/317.pdf

– to return the previously canceled investment tax benefit which consists in the exemption of enterprises from taxation of a part of the tax base, provided that funds are invested in the expansion and modernization of fixed assets for production purposes;

– to introduce a flexible system of tax deductions for RTD expenses which contributes to industry transition to higher technological structures;

– to form of a network of regional funds to support scientific research and innovation activities allowing to significantly increase investment in RTD [26];

– to maintain a temporary investment tax incentive as a tool to support enterprises in the framework of post-pandemic economic recovery. This will help to reduce enterprises' costs in the short-term period for investment (from 1 to 3 years). Strict time periodization encourages the acceleration of current investment expenditures with the possibility of using tax incentives.

The proposed measures will contribute to the growth of investments in high-tech activity spheres which will not only increase the competitiveness of Russian enterprises, but also strengthen their investment attractiveness. According to the estimates of the International Monetary Fund, a change in the tax burden by 1% contributes to the growth of investments from 2.6 to 14% [27; 28].

3. Development of value chains as a part of the adjustment of the state economic policy.

Stimulating investment processes is possible on the basis of the development of value chains (VC) in priority economic sectors. The formed sectoral and territorial investment disparities are, among other things, a consequence of the gaps in the VC. Creating production stages that are absent in the country, stimulating domestic demand (both final and intermediate) along the value chains, supporting the development of production cooperation will contribute to income redistribution in the economy, thereby increasing investment opportunities.

The internal economic policy of the state can become a decisive factor in the formation of conditions for the unification of economic entities in the VC, as it is the state that creates favorable conditions for interaction of firms, regions and industries with higher-level markets, and also determines the potential for improving these relations. Currently, Russia is an active participant in the international division of labor, but the current format of the country's participation in the global value chains is far from optimal: mainly the Russian Federation is a supplier of intermediate products and a consumer of finished final goods. To change the situation (i.e., to integrate Russian companies into more profitable areas of global value chains in terms of added value), it is necessary:

– to form a system for managing VC transformation in the Russian economy (perhaps the renaissance of special state macro-regional funds in the context of the VC development; the examples are the European Interregional Initiative in the field of smart specialization "Avangard", the Interregional Partnership RIS3 "Safe and sustainable mobility" [29]);

– to conduct an in-depth analysis of the existing VC in the Russian economy (including taking into account their external sites), design their prospective development (based on technological scanning and forecasting, competitive intelligence, implementing the concept of smart specialization of territories, etc.), form a system of macro-regional VC planning;

– to develop and implement a unified investment, structural, and technological policy at the macro-regional level (coordinated investment attraction plans); to accumulate investment resources in the form of macro-regional development funds (corporations) (integrated territorial investments);

– to provide with infrastructure support for projects' implementation within the framework of the VC development, etc.

We are sure that creating conditions for ensuring access of economic entities to investment resources, increasing RTD costs, eliminating sectoral and territorial disparities will contribute to solving the existing problems in the investment sphere and strengthening the Russian economy.

Conclusion

Investments in fixed assets are a key driver of economic growth. The renewal of fixed assets and creation of new production capacities will help to increase the competitiveness of the Russian economy and deepen its integration into the global division of labor. The main reason for the current restrictions on investment development was the export-raw materials model of the Russian economy which led to dependence on foreign markets for raw materials and capital, contributed to the destruction of internal economic ties and reduced domestic demand for many types of goods and services.

Activation of investment activity requires active state participation. The recommendations can be used by the authorities when adjusting the state investment, monetary and structural-industrial policy. The research contribution to science is to identify modern patterns of investment processes in the Russian economy, as well as to define promising areas for enhancing investment activity. Further scientific research will be related to the study of institutional factors of investment activity activation in the Russian economy and forecasting the results of implementation of the proposed recommendations.

References

1. Kuvalin D.B., Zinchenko Yu.V., Lavrinenko P.A. Russian enterprises in the spring 2020: Covid-19 pandemic reactions and opinions on the role of the state in the economy. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 2021, no. 1, pp. 164–176 (in Russian).
2. Smith A. *Issledovanie o prirode i prichinakh bogatstva narodov* [An Inquiry into the Nature and Causes of the Wealth of Nations]. Introduction and comments of V.S. Afanas'ev. Moscow: Izd-vo sotsial'no-ekonomicheskoi literatury, 1962. 684 p.
3. Harrod R.F. An essay in dynamic theory. *The Economic Journal,* 1939, vol. 49, no. 193, pp. 14–33.
4. Domar E.D. The «Burden of the Debt» and the national income. *The American Economic Review*, 1944, vol. 34, no. 4, pp. 798–827.
5. Solow R.M. A Contribution to the theory of economic growth. *The Quarterly Journal of Economics,* 1956, vol. 70, no. 1, pp. 65–94.
6. Romer P.M. Increasing returns and long-run growth. *The Journal of Political Economy,* 1986, vol. 94, no. 5 (October), pp. 1002–1037.
7. Romer P.M. Growth based on increasing returns due to specialization. *American Economic Review,* 1987, vol. 77, no. 2 (May), pp. 56–62.
8. Lucas R.E. On the mechanics of economic development. *Journal of Monetary Economics*, 1988, vol. 22, no. 1, pp. 3–42.
9. Grossman M. The Human Capital Model. In: Culyer A.J., Newhouse J.P., editors. *Handbook of Health Economics*, 2000, ed. 1, vol. 1, chapter 7, pp. 347–408.
10. Aghion P.M., Howitt P.W. A model of growth through creative destruction. *NBER Working Paper,* 1990, no. 3223. DOI: 10.3386/w3223
11. Aghion P.M., Howitt P.W. A model of growth through creative destruction. *Econometrica,* 1992, vol. 60, no. 2, pp. 323–351.

12. Aganbegyan A.G. How to resume social and economic growth in Russia? *Nauchnye trudy Vol'nogo ekonomicheskogo obshchestva Rossii=Scientific Works of the Free Economic Society of Russia*, 2020, vol. 222, no. 2, pp. 164–182 (in Russian).
13. Aganbegyan A.G. Investment – the basis of the acceleration of the socio-economic development of Russia. *Den'gi i kredit=Russian Journal of Money and Finance*, 2012, no. 5, pp. 10–16 (in Russian).
14. Ivanter V.V. Structural-investment component of long-term economic strategy of Russia. *Obshchestvo i ekonomika=Society and Economics*, 2017, no. 8, pp. 5–32 (in Russian).
15. Obolensky V.P., Kvashnina I.A. Fixed investment: Financing opportunities. *Rossiiskii vneshneekonomicheskii vestnik=Russian Foreign Economic Journal*, 2016, no. 4, pp. 83–93 (in Russian).
16. Akindinova N.V., Bessonov V.A., Yasin E.G. Russian economy: From transformation to development. In: *dokl. k XIX Apr. mezhdunar. nauch. konf. po problemam razvitiya ekonomiki i obshchestva, Moskva, 10–13 apr. 2018 g.* [Report for the XIX April Conference on the issues of economy and society development. Moscow, April 10-13, 2018]. Moscow: HSE Publishing, 2018. 55 p.
17. *Strukturno-investitsionnaya politika v tselyakh obespecheniya ekonomicheskogo rosta v Rossii: monografiya* [Structural and investment policy in order to ensure economic growth in Russia: Monograph]. Ed. by RAS Academician V.V. Ivanter. Moscow: Nauchnyi konsul'tant, 2017. 196 p.
18. Budanov I.A. Russia waiting for investment growth: Threats and opportunities. *Ekonomist=Economist*, 2019, no. 1, pp. 9–22 (in Russian).
19. Turygin O.M. Growth of fixed capital investments in the regional economy by increasing debt financing. *Ekonomika regiona=Economy of Region*, 2020, vol. 16, no. 4, pp. 1348–1361. DOI: https://doi.org/10.17059/ekon.reg.2020-4-23
20. Ivanter A.A. et al. Reform of the negative KPI system. *Ekspert=Expert*, 2020, no. 49, pp. 13–18 (in Russian).
21. Gurova I.P. Offshore investment in the Russian economy. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 2020, no. 4, pp. 122–132 (in Russian).
22. Rumyantsev N.M. Justification of territorial investment priorities in the Northwestern Federal District. *Voprosy territorial'nogo razvitiya=Territorial Development Issues*, 2019, no. 5 (50). Available at: http://vtr.isert-ran.ru/article/28377 DOI: 10.15838/tdi.2019.5.50.3 (in Russian).
23. Uskova T.V., Kopytova E.D. On the role of investment in the socio-economic development of territories. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2015, no. 2 (38), pp. 72–89. DOI: 10.15838/esc/2015.2.38.4 (in Russian).
24. Glazyev S.Yu. A methodology for accelerated economic growth: Achieving the economic breakthrough goal set by the President of Russia. *Nauchnye trudy Vol'nogo ekonomicheskogo obshchestva Rossii=Scientific Works of the Free Economic Society of Russia*, 2019, vol. 218, no. 4, pp. 124–132 (in Russian).
25. *Investitsionnyi protsess i strukturnaya transformatsiya rossiiskoi ekonomiki: monografiya* [Investment Process and Structural Transformation of the Russian Economy: Monograph]. Ed. by Doctor of Sciences (Economics) A.V. Alekseev, Candidate of Sciences (History) L.K. Kazantseva. Novosibirsk: IEOPP SO RAN, 2020. 402 p.
26. Mazilov E.A., Davydova A.A. Scientific and technological development of Russia: State assessment and financing problems. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2020, vol. 13, no. 5, pp. 55–73. DOI: 10.15838/esc.2020.5.71.3 (in Russian).
27. Zwick E., Mahon J. Tax policy and heterogeneous investment behavior. *The American Economic Review,* 2017, vol. 107, no. 1, pp. 217–248.
28. Maffini G., Xing J., Devereux M.P. The impact of investment incentives: Evidence from UK corporation tax returns. *American Economic Journal: Economic Policy.* 2019, vol. 11, no. 3.
29. Kotov A.V. The territory requires coherent work: The role of interregional interactions in economic recovery (To the 100th anniversary of I.G. Aleksandrov's work 'Economic Regionalization of Russia'). *Prostranstvennaya ekonomika=Spatial Economics*, 2021, vol. 17, no. 1, pp. 18–34 (in Russian).

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Territories' Predisposition Assessment to "Smart" Companies' Location*

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Abstract. Currently, one of the urgent issues for the Russian economy is to create conditions for the expansion of "smart" companies in the regions on which depend the society transition to a new type of technological structure, innovative development and the country's competitiveness. The hypothesis of the study is that some regions are more predisposed to the appearance of "smart" companies on their territories, while others do not have the appropriate conditions for developing innovative and digital technologies. To prove this hypothesis, the article reveals the concept of a regional 3D model of a "smart" company and offers a methodology for assessing regions' predisposition to the emergence of such organizations. A special feature of the author's methodology is an integrated indicator which is the result of the synthesis of graphical and analytical evaluation methods. The methodology allows identifying territories with favorable conditions for expansion of organizational ambidextrity, innovative development and companies' digitalization. It was tested in Russia's regions in 2010–2017. As a result, the paper has identified the typology of regions according to five criteria reflecting the predisposition to the emergence of "smart" companies, and has built their rating. The approbation of the author's methodological developments allowed establishing that industrially developed regions can be considered digitalization poles. The work shows that the Ural Federal District acts as a stable basis for the emergence and successful functioning of "smart" companies, as all its entities, except the Kurgan Oblast, fall into the top twenty territories favorable for their development. This pattern is not typical for other federal districts. In conclusion, the authors have determined principal development trajectories of the main elements of the 3D model of a "smart" company at the meso-economic research level in the following areas: "smart" personnel, "smart" environment, "smart" innovations and solutions.

Key words: "smart" company, organizational ambidextrity, innovative company development, companies' digitalization, 3D model of the company, assessment, region's predisposition.

Introduction

Currently, one of the urgent issues for the Russian economy is to create conditions in the regions for the expansion of "smart" companies on which the transition of society to a new type of technological structure, innovative development, quality of life and competitiveness of the country as a whole depend.

The concept of a "smart" company is mainly found in foreign sources and is understood as an organization functioning as an open system accepting information, material resources and energy from the environment, converting these resources into knowledge, processes and structures that produce goods or services, in turn consumed by the environment [1–4]. The relationship between the environment and "smart" companies is both cyclical and critical, due to the environ-ment interdependence in terms of resources and justification for its continued existence [5].

As the environment becomes increasingly complex and volatile, maintaining viability requires companies to have sufficient knowledge about its current and likely future conditions, as well as timely application of knowledge to change their own behavior and positioning. In this regard, the models of "smart" companies are of absolute scientific interest. They are studied at the corporate level which clarifies the structural elements, characteristics, behavioral attitudes in the dynamic conditions of the external environment and develops recommendations for a particular company on how to increase knowledge level of organization's employees.

The object of the research is the regions of the Russian Federation. The subject of the study is the system of socio-economic relations that arise in the process of the emergence and expansion of "smart" companies. The purpose of the work is to design a 3D model of a "smart" company and assess the predisposition of territories to host organizations of this type on them.

The purpose predetermined the solution of the following tasks: to form the authors' understanding of a "smart" company; to develop a model of a "smart" company at the regional level; to develop a methodology for assessing the region's predisposition to the emergence and expansion of "smart" companies; to identify regions with the maximum predisposition and determine the support areas for successful functioning of such organizations.

Theoretical aspects of the concept of a "smart" company: an overview

Currently, the concept of a "smart" company is revealed meaningfully in general at the corporate or microeconomic level of research. However, there was no unambiguous understanding of this definition. For example, scientists at the University of Stuttgart define it as a production system that, being aware of the context, helps employees and equipment to perform tasks. There is a view that this is any robotic system that uses networks of sensors and computing devices that interact with each other to achieve highly efficient production [6] which, in turn, determines the technical content of a "smart" company as one of the dimensions of multi-scale production, involving the use of the most advanced tools and technologies of ubiquitous computerization. This point of view is based on the idea of a "smart" company as an environment capable of coping with the turbulence of the production process in real time through the use of a decentralized information and communication structure for managing the production process [7].

L. Kapustina and Yu. Kondratenko conclude that a "smart" company uses the results of digital factories (as an input product) and assumes production without human participation based on artificial intelligence and flexible integration (both between divisions within and with external partners). At the same time, digital factories themselves are the forerunners of smart enterprises [8].

E. Filos thinks that "smart" companies have as their goal a wider use of automation tools, improved control and optimization of processes. At the same time, he shares the concepts of "smart", "virtual" and "digital" companies believing that they differ in the purpose of creation, the means of achieving the goal and the emphasis in the work [9].

Despite the lack of a single definition, the main criteria for a "smart" company can already include data collection using sensors and transmitters, the Internet of Things, data storage in cloud services, information processing based on big data algorithms, the presence of human-machine interfaces and a digital platform that includes a common database and production cycle management tools and makes up an ecosystem, formation of a customized business model. In such an organization, the scale effect loses its meaning, due to the possibility of rapid changeover and restructuring of technological processes controlled by decentralized artificial intelligence to meet the orders and needs of specific individual customers [8].

In addition to the technical aspect, the definition of a "smart" company in the scientific literature is considered in two aspects: an organization that has knowledge or creates it. In the first case, we are talking about smart companies that are able to accumulate and multiply knowledge that allows solving problems of competitiveness in a dynamic environment. Moreover, the prefix "smart" is added to the concept of a company or organization when it is assumed that it uses "smart" technologies. Knowledge creation occurs when novelty is generated to solve new problems for which adequate solutions cannot be found in the knowledge base. The context of the intellectual behavior of the organization here is the solution to problems which implies the achievement of goals and objectives. In this case, the mind (intelligence) of the company is manifested not in the amount of accumulated knowledge, but rather in the ability to find original solutions to overcome various difficulties and resolve various life situations, or simply accurately assess them and use it to their advantage. Such companies are called "intelligent organizations", the very concept of a "smart" company is broader than the concept of a "smart company", and the first includes the second [10; 11; 12].

The company's "mind" can also be understood as a quality of behavior that is adaptive in the sense that it represents effective ways to meet the requirements of the environment as they change [13]. Thus, smart behavior is both purposeful and adaptive [14; 15], and it is the ability of organizations to possess knowledge, create and apply it that will be crucial in the future.

In a series of the works, G. Vilenskii considered a "smart" company from the point of view of collecting, processing, interpreting and transmitting technical and political information necessary in the decision-making process [16]. In his opinion, only a "smart" company is able to protect itself from information pathology which is largely due to the attitude of managers to the process of obtaining knowledge and the ability of information technology specialists to influence

strategic discourse.

According to J. Mark and J. Olsen, the intelligence of a "smart" company is due to "rational calculation and learning based on experience". Rational calculation is the choice of alternatives based on an assessment of their expected consequences in accordance with preferences. This is a look into the future to anticipate the results. Experience-based learning is a choice of alternatives that takes into account the rules developed on the basis of the accumulation of past experience. This is a view into the past to find guidance for future actions. The researchers noticed that, as the limitations of rational calculation are realized, interest in the potential of organizational learning as the basis of organizational intelligence increases. Organizations and their people learn through their interaction with the environment – "they act, observe the consequences of their actions, draw conclusions about these consequences and draw conclusions for future actions. This process is adaptively rational" [17].

J.B. Quinn described a "smart" company as "an organization that primarily manages and coordinates information to meet customer needs" [18]. The "mind" of an organization depends more on the development and use of intellectual resources than on the management of physical and financial assets. Its functions are divided into managed intelligent clusters, the so-called service activities. At one time, information technologies made it possible to delegate and outsource many of these activities to other organizations which strengthened the competitive position in the market. Instead of focusing narrowly on products, a smart company succeeds in several key knowledge-based activities that are critical to its customers, and surrounds them with other activities necessary to protect the core. Then, it uses advanced information, management and intelligent systems to coordinate many other diverse and often dispersed centers of activity needed to meet customer needs. As an example, we can cite the Russian company "Dodo Pizza". Openness and the Internet helped the Syktyvkar Company to become a market leader without a big history. Its own information system which it started using from the first day of work allows the company to permanently observe online what is happening in the business. Everything that has the Internet access can be integrated into this system. This is an example of creating value through the use of several critical types of knowledge-based services and the effective use of organizational intelligence.

Later, in 1996, Quinn co-authored with Anderson and Finkelstein described the intelligence of a "smart" company as having: 1) cognitive knowledge, 2) advanced skills, 3) systematic understanding and trained intuition, as well as 4) self-motivated creativity [19].

S. Haeckel and R. Nolan define a "smart" company as an organization that has "the ability and possibility to cope with complex situations in dynamic realities, that is, to capture, perceive, share and extract meaning from market signals" [20].

The complexity of managing a "smart" organization, in turn, is due to the volume and quality of information sources that are necessary for this, the number of business elements that should be coordinated within its organizational structure, as well as the number and type of connections of these elements. According to the analysis, the "intelligence level" (IQ) of an organization is determined by three important attributes: the ability to access knowledge and information (connecting); the ability to integrate and share information (sharing) and the ability to extract meaning from data (structuring). Connecting means that infor-

mation sources, media, locations and users are connected in such a way that accurate information can be obtained and accessed by the right users at the right time and in the right place. Sharing means that people in an organization can share data, interpretations of data, as well as understanding of the main organization's processes. Structuring means that understanding, or meaning, is achieved by comparing and correlating information from several sources in such a way that some form of pattern or trend arises. Structuring is achieved by creating information about information, for example, how data is organized, connected and used. S. Haeckel and R. Nolan believe that structuring has the greatest potential for the strategic application of information to create a "smart" company.

According to T. Liang, the intelligence of a "smart" company begins with the intelligence of the divisions and members of organization; therefore, the scientist's research is related to the analysis of the mental abilities of individuals, as well as the influence of individual intellectual characteristics of a person involved in the formation of collective intelligence [21; 22].

M. McMaster noted in his works that in order to compete effectively, companies must be adaptive entities that directly welcome changes, constantly collecting information, generating new knowledge and introducing innovations based on these changes. He defined organizational intelligence as a function of the number of connections, their complexity and system design, as the main resource of a "smart" company [23].

M.A. Glynn gives a "smart" company information processing competencies that allow adapting to environmental requirements that initiate the development and implementation of innovations [24]. W.E. Halal gives the following definition: organizational intelligence is a function of five cognitive subsystems: organizational structure, culture, relationships with stakeholders, knowledge management and strategic processes [25]. According to J. Leibowitz, a "smart" company integrates the collective totality of all intelligences that contribute to building a common vision, the process of renewal and the direction of organization's activities [26].

A. Bollinger and R. Smith prove that the intelligence of a "smart" company is not just the sum of individuals' knowledge, but the synergy of employees' interpretations of information based on personal experience, skills, abilities and observations, as well as experience gained over time. Such characteristics allow understanding it as a strategic asset [27]. For a smart organization, knowledge is defined as what the staff knows about their suppliers, customers, products, processes, mistakes and successes. Knowledge can be placed in databases or distributed in experience and information about practice.

In addition, one of the characteristic features of a "smart" company is the ability to quickly respond to changes and complexities. It is obvious that the IQ of such an organization will be the higher, the stronger this ability is. From this point of view, the model of ambidextrous organizations is of interest, whose organizational design allows extracting profit from current economic activities (operational activities) successfully in the same way and exploring opportunities for creating new types of activities through the production of consistent and radical innovations (research activities). These companies use various strategies for producing innovations both internally and with the help of external developments [28].

Z. Simsek and his colleagues have developed a model of organizational ambidextrity according to two parameters: temporal (according to which ambidextrity can be sequential and simultaneous)

and structural (independent and interdependent ambidextrity). Comparing these parameters, the researchers presented a typology with the identification of four types of organizational ambidextrity: harmonic, cyclic, divided and mutual [29]. So, for example, with the strategy of divided ambidextrity in business, there are two parallel working lines: the group of the present, responsible for current activities, and the group of the future which is looking for an answer to the question of how to transform the company. The team managing the profile business must perform its work effectively. The other team should move away from the current model and fully focus on ways to transform it. For a manager in this case, the main difficulty is to manage the business and at the same time rethink it.

Thus, the analysis of the concepts presented above allows identifying the following distinctive features of "smart" companies:

1. *The ability to "smart" action and "smart" response* (technical efficiency, cost efficiency and benefits are maximized through planning, continuous monitoring of operations and continuous training).

2. *Operational assets of a "smart" company* are an environment in which employees can use any device or mode to perform their work, have direct access to secure reliable information and be completely immersed in the business process.

3. Employees of the *"smart" company have full access to the necessary information* at any time.

4. A necessary feature of a "smart" company is *highly qualified workforce*.

5. Employees of the "smart" company are trained to carry out actions that ensure the *strategic efficiency of an enterprise*.

However, the distinctive features of a "smart" company presented above allow building its model only at the microeconomic level of research, when the object is the company itself, and the subject is the organizational and economic relations that arise in the process of designing its model. We propose a different approach that allows building a 3D model of a "smart" company at the regional, or meso-economic, research level using a three-dimensional space that reflects the regional parameters of "smart" development, i.e. contributing to the emergence and expansion of such companies.

3D model of a "smart" company

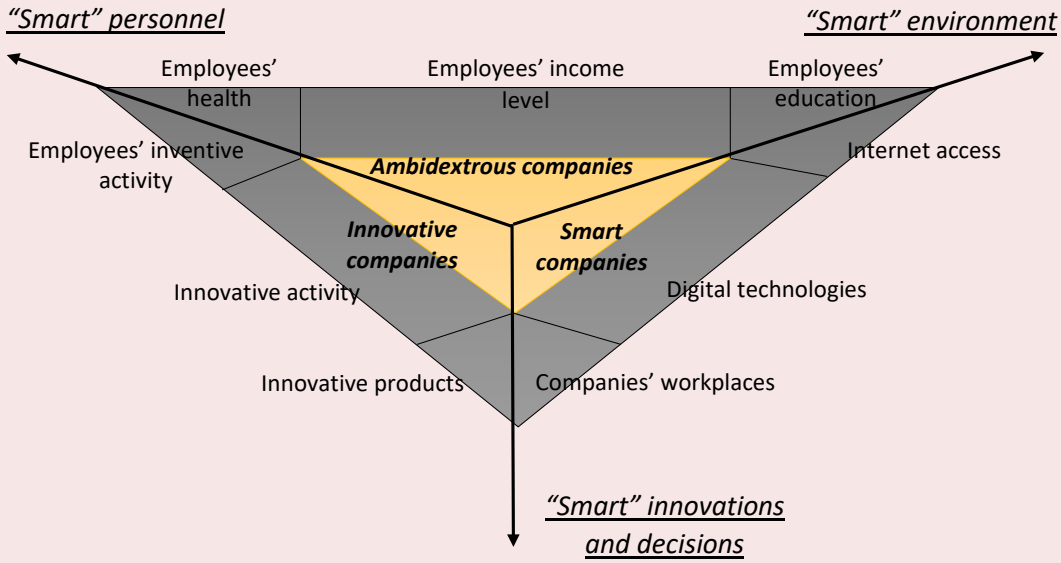
So, let us clarify that by "intelligent" company we will understand a company whose characteristics include the features of innovative organizations, ambidextrous companies and smart companies which determines its economic role as a basic actor of technological transformation and transition to a more innovatively complex sixth way. Based on this understanding, we have developed its model *(Fig. 1)*.

The most significant elements of a "smart" company which can be used in the future not only to identify it in the market, but also to determine the predisposition of regions to the emergence of such organizations, are:

– "smart" staff (IQ_people) whose knowledge, skills and abilities determine productivity level and possibility of simultaneously solving problems of various thematic areas (an element of ambidextrous companies);

– "smart" innovations and solutions (IQ_innovative) which allow producing high-tech products in demand on the market, offering new technical and technological ideas of revolutionary nature, as well as improving production chains, management systems, marketing tools, etc. in order to increase the company's competitiveness and ensure its profitability growth (an element of innovative companies);

Figure 1. 3D model of a "smart" company



Source: own compilations.

– a "smart" environment (IQ_digital), organized using the Internet capabilities that allow working with a large and complex amount of information using various platforms that optimize time and simplify technological value chains (an element of smart companies).

In fact, currently, a "smart" company may not have production funds in their traditional sense at all, as tangible assets are beginning to be replaced by intellectual assets, and current assets – by information [30]. According to experts, currently in the United States, approximately 45 million people use only their own intelligence, backed up by a personal computer, as production means [31].

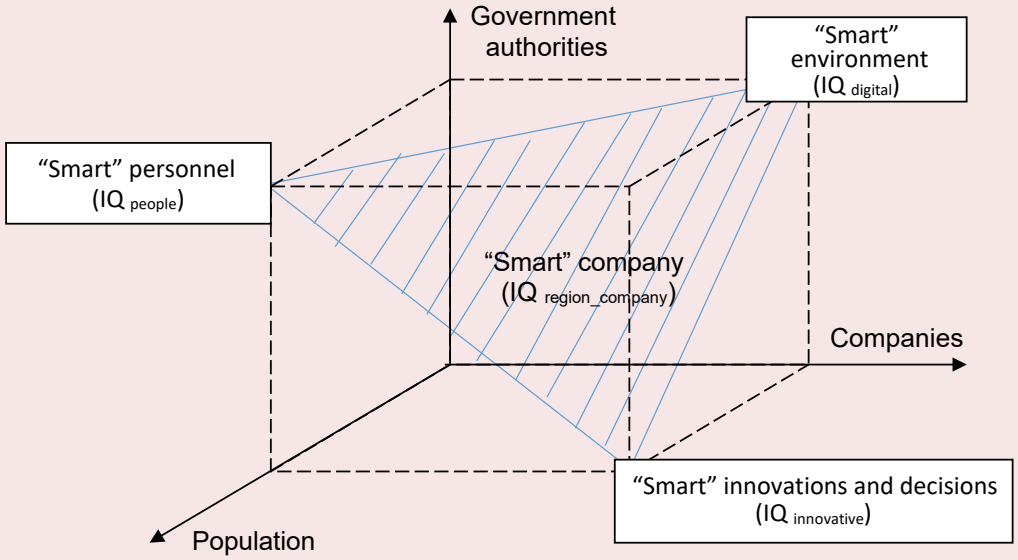
Research methodology

If we graphically present the author's method of assessing the predisposition of regions to the emergence of "smart" companies, we get the following spatial model; its main elements are companies, population and authorities *(Fig. 2)*.

Authorities' interaction with population allows increasing the share of "smart" personnel in total population by implementing measures aimed at supporting healthcare, education and improving the level and quality of life in the regional society. Authorities' interaction with companies contributes to creating conditions for society digitalization through implementation of various strategies and programs for the regional digital development. The quality and quantity of innovative products developed and implemented depend on companies' interaction with population, so it is important to introduce the concept of "talent management" into practice at all enterprises, focused on the goals of intellectual development of personnel and improving their applied effectiveness. There can be many options for interaction, and the active points that serve as the vertices of the triangle are the same. They serve as indicators of regions' predisposition to generate "smart" companies on their territory.

Taking into account the authors' understanding of the 3D model of "smart" companies, we propose a methodological approach which is a synthesis of graphical and analytical calculation methods

Figure 2. Graphical assessment representation of the region's predisposition to the emergence of "smart" companies



Source: own compilations.

of assessment consisting of three main stages of identifying the predisposition of regions to the expansion of "smart" companies in their territories.

Stage 1. Regions' assessment in the context of their predisposition to the emergence of "smart" companies:

1.1. Determination of the regions' predisposition to appearance of organizational ambidextrity.

1.2. Determination of the regions' predisposition to activate innovative development.

1.3. Determination of the regions' predisposition to stimulate the use of digital technologies in business.

Stage 2. Regions' typologization and rating according to the criterion of predisposition to the emergence of "smart" companies.

Stage 3. Regions' identification with maximum focus on the support and expansion of "smart" companies.

The first stage is the main and complex, therefore, for its implementation, we have developed an evaluation tool that allows formalizing a 3D model of a "smart" company in a complex indicator *(Tab. 1)*.

Thus, the region's predisposition to organizational ambidextrity is determined by the indicator of public health level, as the dependence of the knowledge level on the presence of chronic diseases is proved: the higher the incidence, the worse the indicators of knowledge among the population. In addition, a healthy person has greater productivity and can be involved in solving more complex and heterogeneous tasks. As a measurable indicator, we propose to use the indicator of life expectancy at birth which reflects population longevity, and therefore public health level.

Public education level characterizes the regional intellectual potential, people's ability to think creatively and solve several tasks simultaneously. In this regard, the most informative indicator will be the share of the employed population with higher education in the total number of employed.

Table 1. Estimated indicators of the region's predisposition to the emergence of "smart" companies in the context of a 3D model

Region's predisposition	Basic element	Indicator	Tracer
Toward organizational ambidextrity	"Smart" personnel (IQ_{people})	Public health level ($I_{healthy}$)	Life expectancy at birth
		Public education level (I_{know})	Share of population with higher education in total number of employees
		Population profitability (G)	Gini index
Toward innovative development of companies	"Smart" innovations and decisions ($IQ_{innovative}$)	Population inventive activity ($I_{intellegent}$)	Number of domestic patent applications for inventions, per employed person
		Companies' innovative activity ($I_{innovative\_technology}$)	Share of organizations using innovative technologies, in total number of surveyed organizations
		Innovative products ($I_{innovative\_product}$)	Share of innovative products in total number of shipped products
Toward companies' digitalization	"Smart" environment ($IQ_{digital}$)	Internet access (I_{Inet})	Share of organizations using Internet access with speed of at least 2 Mbit/sec in total number of organizations
		Digital technologies ($I_{digital\_technology}$)	Share of organizations using ERP system in total number of surveyed organizations; Share of organizations that had special software for managing sales of goods in total number of organizations; Share of organization using information and communication technologies in total number of organizations
		Workplaces (I_{work_space})	Share of people employed in ICT sector in total number of employed people

Source: own compilations.

Population profitability also affects the conditions for its self-development including obtaining additional and continuing education which positively affects the society labor potential. In our opinion, an important evaluation indicator here is the stratification of population by received income. The higher the stratification, the lower the regional tendency to organizational ambidexterity is. The measured indicator is the Gini index.

Then the indicator that allows identifying the presence of "smart" personnel in the region (IQ_{people}) will be calculated using the Formula 1:

$$IQ_{people} = \sqrt[3]{I_{healthy} * I_{know}/G}, \quad (1)$$

where $I_{healthy}$ – public health level;

I_{know} – public education level;

G – population profitability in the region.

We propose to assess the region's predisposition to further development of innovative business activity on the basis of measuring such an indicator as inventive activity calculated as the number of domestic patent applications for inventions per employee indicating the effectiveness of knowledge application in production practice. Another indicator that we recommend using concerns the innovative activity of enterprises, manifested in the development and use of organizational, marketing, technological and other types of innovations which reflects the demand for new ideas to maintain competitive positions in the Russian market. The practical result of bringing inventive and innovative solutions to the consumer is the demand for innovative products, so its share in the total volume of shipped products must also be taken into account.

We get that the indicator "smart" innovations and solutions ($IQ_{innovative}$) is determined by measuring the effectiveness of innovation activities in the region and the demand for companies' products by "smart" people (Formula 2).

$$IQ_{innovative} = \sqrt[3]{I_{intellegent} * I_{innovative\_technology} * I_{innovative\_product}}, \quad (2)$$

where $I_{intellegent}$ – population inventive activity;

$I_{innovative\_technology}$ – companies' innovative activity;

$I_{innovative\_product}$ – innovative products in the region.

We propose to assess the region's predisposition to creating conditions for the expansion of smart companies on the basis of measuring the Internet access for organizations based on the indicator the share of organizations using Internet access at a speed of at least 2 Mbit/s in the total number of organizations which will indicate the infrastructural features of digitalization of the regional companies. We also propose to take into account the digital business technologies used by organizations, in the context of the shares of organizations that used ERP systems, had special software tools for managing sales of goods and used information and communication technologies, in the total number of surveyed organizations. Another indicator that characterizes the conditions of business digitalization, in our opinion, is the labor market from the position of those employed in the ICT sector in the total number of employed population which indicates, firstly, the demand for IT competencies, and secondly, the presence of appropriate jobs in the region. Then we get that the indicator "smart" environment ($IQ_{digital}$) is determined by measuring the quality of conditions that stimulate business digitalization in the region according to Formula 3.

$$IQ_{digital} = \sqrt[3]{I_{Inet} * I_{digital\_technology} * I_{work\_space}}, \quad (3)$$

where I_{Inet} – Internet access;

$I_{digital\_technology}$ – digital technologies;

I_{work_space} – workplaces in the regional ICT sector.

An important point in the calculation of indicators is their mandatory normalization in the range [0; 1] which allows bringing their values to one measuring scale.

Returning to the 3D model of the "smart" company presented in Figure 2, we get that the desired predisposition indicator can be calculated as the area of a triangle that graphically takes into account three active points – the basic indicators of the expansion parameters of "smart" companies on its territory (Formulas 4–8).

$$a = \sqrt[2]{IQ_{people}{}^2 + IQ_{innovative}{}^2}, \quad (4)$$

$$b = \sqrt[2]{IQ_{people}{}^2 + IQ_{digital}{}^2}, \quad (5)$$

$$c = \sqrt[2]{IQ_{innovative}{}^2 + IQ_{digital}{}^2}, \quad (6)$$

$$p = a + b + c, \quad (7)$$

$$IQ_{region\_company} = \sqrt[2]{p * (p-a) * (p-b) * (p-c)}, \quad (8)$$

where $IQ_{region\_company}$ – region's predisposition to expansion of "smart" companies;

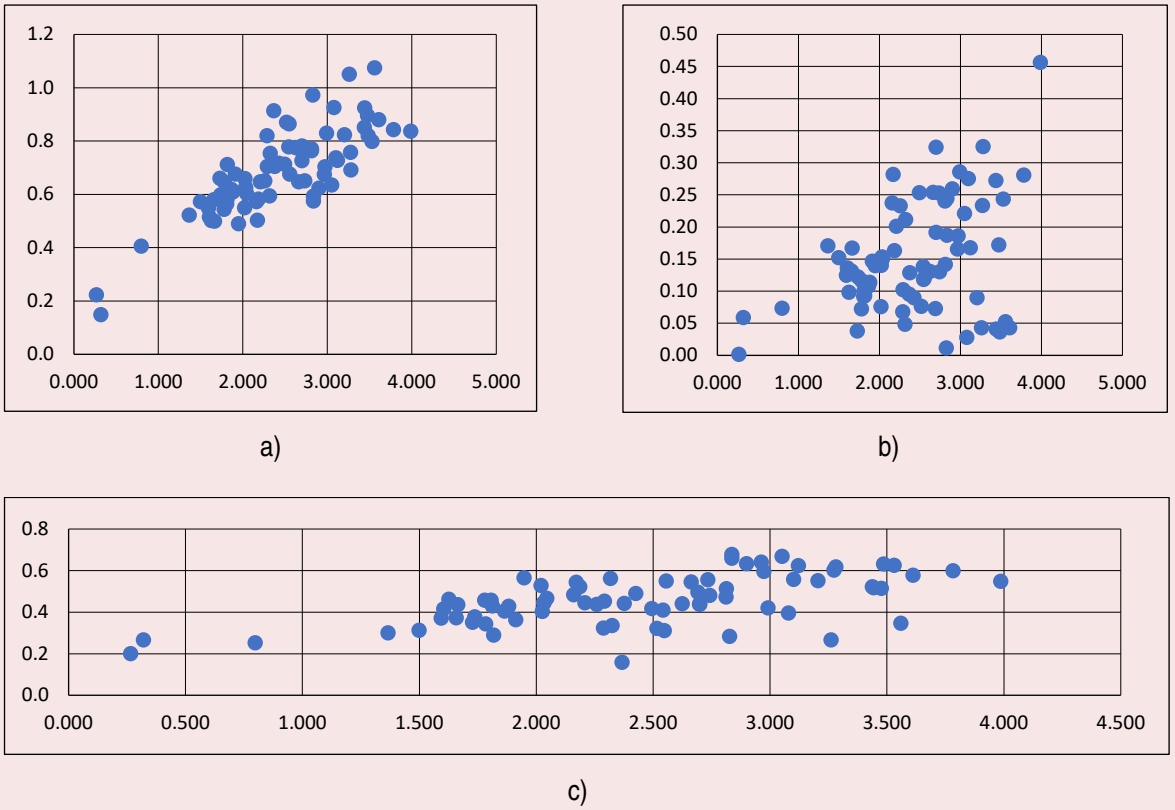
IQ_{people} – region's predisposition to organizational ambidextrity,

$IQ_{innovative}$ – region's predisposition to further innovative development of companies,

$IQ_{digital}$ – region's predisposition to further digitalization of companies.

After assessing the regions' predisposition to the expansion of "smart" companies on their territory, it is necessary to proceed to the second and third methodological stages of the study which allow identifying the most favorable territories for creating and developing companies that are characteristic of a more complex technological structure of the regional and national economy.

Figure 3. Predisposition of the regions of RF to: a) organizational ambidextrity; b) companies' innovative development; c) companies' digitalization



Source: own compilations.

Thus, the peculiarity of the authors' methodology is an integrated indicator which is the result of the synthesis of graphical and analytical methods of assessment. It allows determining the region's predisposition to emerging "smart" companies based on measuring the area of the triangle at the vertices of which the active elements of ambidextrous companies, innovative enterprises and smart organizations are located.

Research results

1. We determine regions' predisposition to the appearance of "smart" companies on their territory.

Initially, all regions participated in the study, the analyzed period covered 2010–2017. However, then the authors were forced to weed out some of the territories due to the lack of data on a number of estimated indicators which determined the participation in the final analysis of only 79 out of 85 territories. Further, the study excluded Moscow, the Moscow Oblast and St. Petersburg due to the obvious maximum parameters that were recorded for them when assessing predisposition.

Figure 3 presents the obtained estimated values of the regions where the values of the $IQ_{region\_company}$ indicator are located on the X axis, and the corresponding predispositions are located on the Y axis: to organizational ambidextrity, to further innovative development and further digitalization of companies.

The largest lag was shown by the Republic of Tyva, Zabaykalsky Krai, the Jewish Autonomous Okrug, Chukotka Autonomous Okrug. Subsequently, these regions were recognized as the most high-risk for creating "smart" companies. We should also note that the majority of the remaining entities of the Russian Federation (72%) have a value of the potential for organizational ambidextrity above the average in the considered range of estimates [0.5; 0.8] with the maximum possible value of 1.2; see Fig. 3 (a)). Compared to other indicators, the predisposition to organizational ambidextrity is of the greatest importance indicating the need for further measures aimed at supporting health, education and increasing the population income level as a whole.

According to the indicator characterizing regions' predisposition to the formation of innovative companies, about 78% of the studied regions have average values in the range [0.05; 0.25] and difficult conditions for activation of innovative business activity; see Fig. 3(b)). This indicates the importance of implementing the strategy of scientific and technological development of the regions and strengthening appropriate support measures.

According to the indicator of predisposition to the formation of smart companies, about 35% of the studied regions have a tendency to digital transformation of society, the values of the indicator lie in the middle range [0.4; 0.5], while they are fixed above the mark characterizing the innovativeness of companies; see Fig. 3 (c)). Consequently, there are the first results of implementation of the State Program "Digital Economy of the Russian Federation" and the strengthening of appropriate support measures.

2. We define the typology and rank the regions according to the criterion "predisposition to the emergence of "smart" companies".

According to the $IQ_{region\_company}$ indicator, the authors have constructed a typology of the regions *(Tab. 2)*. Out of 76 subjects, 14.47% are regions with the most favorable conditions, as well as experience in supporting the emergence of "smart" companies; 34.21% are regions with favorable conditions for emerging "smart" companies in which such organizations are emerging; 42.1% are regions that can be considered as stable platforms for emerging "smart" companies, but in which innovative, digital and social forces are only consolidating; 3.95% – regions with a high risk of success in creation and functioning of "smart" companies; 5.26% – regions in which it is not recommended to create "smart" companies, but it is proposed to develop economic diversification and support small businesses.

Figure 4 shows twenty entities of the Russian Federation characterized by the greatest predisposition to emerging "smart" companies.

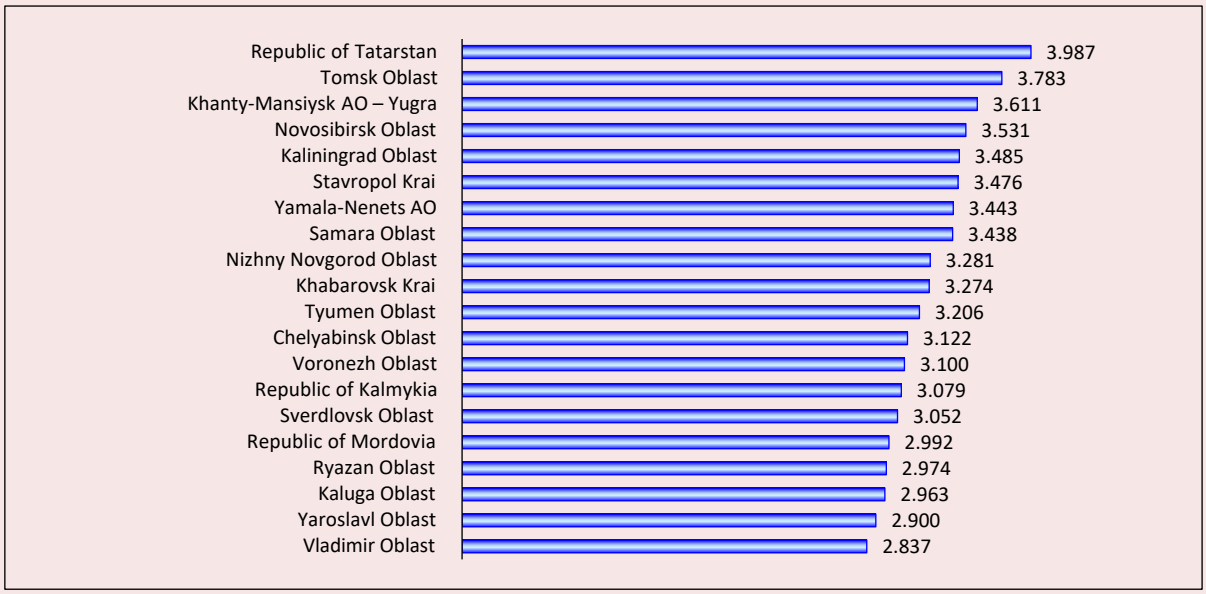
3. We identify regions with the maximum focus on the support and expansion of "smart" companies.

So, within the framework of the received typology, the predisposition of industrially developed regions is of interest. For instance, 65% of industrial regional leaders have a high propensity to generate "smart" companies *(Tab. 3)*. We get that these territories are the leaders not only in their share in the all-Russian value of industrial product shipments, but also in the digital trend of economic and social development. They can be considered the main digitalization poles.

Table 2. Typology of regions by predisposition to merging "smart" companies on their territory

	Typology criterion	Regions
5	Regions that have the most favorable conditions for emerging "smart" companies which already have similar organizations: $IQ_{region\_company} \in [3.21; 4]$	Kaliningrad Oblast, Stavropol Krai, Republic of Tatarstan, Nizhny Novgorod Oblast, Samara Oblast, Tyumen Oblast, Khanty-Mansiysk Autonomous Okrug – Yugra, Yamalo-Nenets Autonomous Okrug, Novosibirsk Oblast, Tomsk Oblast, Khabarovsk Krai
4	Regions with favorable conditions for emerging "smart" companies in which such companies are born: $IQ_{region\_company} \in [2.41; 3.2]$	Belgorod Oblast, Vladimir Oblast, Voronezh Oblast, Kaluga Oblast, Orel Oblast, Ryazan Oblast, Tula Oblast, Yaroslavl Oblast, Leningrad Oblast, Murmansk Oblast, Republic of Adygea, Republic of Kalmykia, Astrakhan Oblast, Volgograd Oblast, Rostov Oblast, Republic of Ingushetia, Kabardino-Balkar Republic, Republic of Mordovia, Udmurt Republic, Chuvash Republic, Penza Oblast, Saratov Oblast, Ulyanovsk Oblast, Sverdlovsk Oblast, Chelyabinsk Oblast, Primorsky Krai
3	Regions that can be considered as stable platforms for emerging "smart" companies, but in which innovative, digital and social forces are only consolidating so far: $IQ_{region\_company} \in [1.61; 2.4]$	Bryansk Oblast, Ivanovo Oblast, Kostroma Oblast, Kursk Oblast, Lipetsk Oblast, Smolensk Oblast, Tambov Oblast, Tver Oblast, Republic of Karelia, Komi Republic, Arkhangelsk Oblast, Nenets Autonomous Okrug, Vologda Oblast, Novgorod Oblast, Pskov Oblast, Krasnodar Krai, Republic of Dagestan, Republic of Bashkortostan, Republic of Mari El, Perm Krai, Kurgan Oblast, Republic of Altai, Krasnoyarsk Kai, Irkutsk Oblast, Kemerovo Oblast, Omsk Oblast, Republic of Buryatia, Republic of Sakha (Yakutia), Kamchatka Krai, Amur Oblast, Magadan Oblast, Sakhalin Oblast
2	Regions where it is not recommended to create "smart" companies, as there are no conditions for their functioning, there is a high risk of running a similarly organized business: $IQ_{region\_company} \in [0.81; 1.6]$	Kirov Oblast, Orenburg Oblast, Altai Krai
1	Regions where it is not recommended to create "smart" companies, but it is proposed to develop economic diversification and support small businesses: $IQ_{region\_company} \in [0; 0.8]$	Republic of Tyva, Trans-Baikal Territory, Jewish Autonomous Okrug, Chukotka Autonomous Okrug
Source: own compilations.		

Figure 4. Regions' rating with the greatest predisposition to emerging "smart" companies



We can note one more remarkable fact: almost all the territories of the Ural Federal District took the leading positions except the Kurgan Oblast. This, in turn, can serve as a basis for state support for the formation of a cluster of "smart" companies in the region.

As we have denoted the regions of the Ural Federal District as territories with favorable conditions for emerging "smart" companies, it is interesting to see their separation from Moscow, St. Petersburg and the Moscow Oblast which were excluded from the analysis due to the unconditional leadership in the desired indicator. The lag of the subjects of the Ural Federal District is 1–19% for the entire period under study. At the same time, the positions in the typology are stable which allows considering them a stable basis for "smart" companies, but actualizes the priority of measures to support them due to asymmetric digital development. Such support should be implemented primarily through the "smart" interaction of state authorities with civil society institutions, science, and business community when implementing innovative, scientific, technological and digital development programs in which it is necessary to take into account geographical, economic, socio-cultural, environmental and other features of municipalities as much as possible and focus on meeting the interests of the local population and business. The development of interregional and international cooperation in implementation of the "Smart City" and "Smart Region" projects aimed at supporting new and young IT companies is also an important measure. Within the framework of the federal program "Development of Research and Scientific-Industrial Cooperation", we recommend continuing the creation of research and educational centers that stimulate the development of knowledge economy.

We see a further comprehensive solution to the problem of increasing regions' predisposition to the expansion of "smart" companies in the formation

Table 3. Regions' predisposition – industrial leaders to emerging "smart" companies

Ural Federal District and regions-leaders	$IQ_{region\_company}$								Regions' typology							
	2010	2011	2012	2013	2014	2015	2016	2017	2010	2011	2012	2013	2014	2015	2016	2017
Leningrad Oblast	2.938	2.652	2.624	2.859	2.371	1.603	3.108	2.291	(4) 73%	(4) 66%	(4) 66%	(4) 71%	(3) 59%	(3) 40%	(4) 78%	(3) 57%
Krasnodar Krai	2.533	2.612	2.319	2.317	2.120	1.886	2.632	2.591	(4) 63%	(4) 65%	(3) 58%	(3) 58%	(3) 53%	(3) 47%	(4) 66%	(4) 65%
Rostov Oblast	2.857	2.851	2.798	3.126	3.164	2.779	2.571	2.357	(4) 71%	(4) 71%	(4) 70%	(4) 78%	(4) 79%	(4) 69%	(4) 64%	(3) 59%
Republic of Bashkortostan	2.179	2.139	2.145	2.296	2.169	1.808	2.239	2.306	(3) 54%	(3) 53%	(3) 54%	(3) 57%	(3) 54%	(3) 45%	(3) 56%	(3) 58%
Republic of Tatarstan	3.220	3.860	3.797	4.204	3.938	3.748	4.608	4.524	(5) 81%	(5) 96%	(5) 95%	(5) 105%	(5) 98%	(5) 94%	(5) 115%	(5) 113%
Perm Krai	2.179	2.258	1.929	2.681	1,.923	1.994	2.292	2.114	(3) 54%	(3) 56%	(3) 48%	(4) 67%	(3) 48%	(3) 50%	(3) 57%	(3) 53%
Nizhny Novgorod Oblast	3.011	3.095	3.002	3.338	3.359	3.704	3.576	3.165	(4) 75%	(4) 77%	(4) 75%	(5) 83%	(5) 84%	(5) 93%	(5) 89%	(4) 79%
Samara Oblast	3.925	4.003	3.657	3.131	2.943	3.045	3.438	3.365	(5) 98%	(5) 100%	(5) 91%	(4) 78%	(4) 74%	(4) 76%	(5) 86%	(5) 84%
Kurgan Oblast	1.843	2.037	1.824	2.121	1.696	1.540	1.534	1.309	(3) 46%	(3) 51%	(3) 46%	(3) 53%	(3) 42%	(2) 38%	(2) 38%	(2) 33%
Sverdlovsk Oblast	2.634	3.018	2.655	3.106	3.323	3.079	3.386	3.215	(4) 66%	(4) 75%	(4) 66%	(4) 78%	(5) 83%	(4) 77%	(5) 85%	(5) 80%
Tyumen Oblast	3.077	3.186	2.971	3.129	3.418	3.126	3.641	3.097	(4) 77%	(4) 80%	(4) 74%	(4) 78%	(5) 85%	(4) 78%	(5) 91%	(4) 77%
Khanty-Mansiysk Autonomous Okrug – Yugra	3.717	3.701	3.444	3.217	3.928	3.594	3.953	3.335	(5) 93%	(5) 93%	(5) 86%	(5) 80%	(5) 98%	(5) 90%	(5) 99%	(5) 83%
Yamala-Nenets Autonomous Okrug	3.259	3.228	3.344	3.766	3.874	2.945	3.748	3.379	(5) 81%	(5) 81%	(5) 84%	(5) 94%	(5) 97%	(4) 74%	(5) 94%	(5) 84%
Chelyabinsk Oblast	2.970	3.049	3.073	3.141	3.382	2.979	3.501	2.881	(4) 74%	(4) 76%	(4) 77%	(4) 79%	(5) 85%	(4) 74%	(5) 88%	(4) 72%
Krasnoyarsk Krai	1.901	2.052	1.961	2.123	2.236	1.968	2.317	1.712	(3) 48%	(3) 51%	(3) 49%	(3) 53%	(3) 56%	(3) 49%	(3) 58%	(3) 43%
Irkutsk Oblast	1.852	1.837	1.915	1.849	1.956	1.485	1.959	1.605	(3) 46%	(3) 46%	(3) 48%	(3) 46%	(3) 49%	(2) 37%	(3) 49%	(3) 40%
Kemerovo Oblast	1.959	2.104	1.788	2.433	2.268	1.787	1.970	1.852	(3) 49%	(3) 53%	(3) 45%	(4) 61%	(3) 57%	(3) 45%	(3) 49%	(3) 46%
Omsk Oblast	2.481	2.313	2.181	2.239	2.055	1.522	1.905	1.566	(4) 62%	(3) 58%	(3) 55%	(3) 56%	(3) 51%	(2) 38%	(3) 48%	(2) 39%

Source: own compilations.

and launch of development trajectories of the main elements of the 3D model of a "smart" company. For example, the priority tasks of the "smart" personnel trajectory should be instilling of healthy lifestyle skills, ensuring the availability of additional education that allows continuously studying the whole life, attracting personnel to the development of advanced technologies. The trajectory of "smart" innovations and solutions should ensure the "smart" management development including implementation of the "talent management" concept at every Russian enterprise, and concentration of innovation space centers in universities, the use of digital technologies that allow balancing the workload of personnel, increasing productivity and improving the quality of offline and online services to colleagues and clients of companies. With the help of the "smart" environment trajectory, there should be solved the tasks of creating a stable and modern digital educational environment, providing support for small and medium-sized businesses and knowledge-intensive businesses in all regions.

The proposed triad of trajectories will not only improve the conditions for the expansion of "smart" companies, but also strengthen their regional 3D model.

Conclusion

Within the framework of the article, the authors propose 3D model meaningfully revealing the main elements of a "smart" company at the regional research level. This understanding allowed the authors to develop a methodological approach and tools for assessing the predisposition of Russian regions to the emergence and expansion of these organizations. The use of the authors' developments contributed to the regions' typologization identifying five groups of territories with different conditions for emerging of "smart" companies emphasizing the specifics of their functioning. Rating of the entities of the Russian Federation according to the desired indicator makes it possible to take timely measures to stimulate digital development of industrially developed territories and identify a stable basis for the expansion of "smart" companies.

The authors' tools are of practical importance for authorities and businesses involved in working out regional strategies and programs for development of advanced production technologies aimed at creating comfortable conditions that determine the emergence and successful existence of ambidextrous companies, innovative enterprises and smart companies in Russia's regions.

References

1. Urena Y.C., Quinones E., Carruyo N. Intellectual capital: Strategic model for quality of service in intelligent organizations. *Orbis,* 2016, vol. 12 (35), pp. 3–17.
2. Schwaninger M. Governance for intelligent organizations: A cybernetic contribution. *Kybernetes,* 2019, vol. 48 (1), pp. 35–57. DOI: 10.1108/k-01-2018-0019
3. Gajowiak M. *High-Tech SMEs in the Concept of Intelligent Organizations: The Reconstruction of the Approach in the Light of Empirical Research*. 2016.
4. Hiniesta F.R. Study on intelligent organizations in Andalusia. *Revista Fuentes,* 2016, vol. 18 (1), pp. 15–32. DOI: 10.12795/revistafuentes.2016.18.1.01
5. Adamczewski P. Knowledge management of intelligent organizations in turbulent environment. In: Omazic M.A., Roska V., Grobelna A. (Eds.) *Economic and Social Development*, 2018. Pp. 413–422.
6. Kondratenko Yu.N. "Smart" enterprise in the industry of the region: Concept and prospects. In: *Ural – XXI vek: region innovatsionnogo razvitiya (materialy II Mezhdunar. nauch.-prakt. konf)* [Ural – XXI century:

A region of innovative development (Proceedings of the II International research-to-practice conference)], 2017. Pp. 158–164 (in Russian).

7. Knyaginin V.N. «*Umnye» sredy, «umnye» sistemy, «umnye» proizvodstva: Promyshlennyi i tekhnologicheskii forsait Rossiiskoi Federatsii na dolgosrochnuyu perspektivu* ["Smart" environments, "smart" systems, "smart" industries: Industrial and technological foresight of the Russian Federation for the long term]. CSR North-West, 2013.
8. Kapustina L.M., Kondratenko Yu.N. On the issue of the concept of "smart enterprise" in the digital economy. *Voprosy upravleniya=Management Issues*, 2020, no. 4 (65). DOI: 10.22394/2304-3369-2020-4-33-43 (in Russian).
9. Filos E., Helmrath C., Riemenschneider R. «Smart factories» *with next Generation of Production Systems.* 2011. Available at: http://ec.europa.eu/research/industrial_technologies/pdf/conference2011/fof-1-5-rolf-riemenschneider-christoph-helmrath-11072011_en.pdf (accessed: December 22, 2020).
10. Espinoza M.P.G., Secaira J.I.M., Roca F.F.L. Knowledge management for the development of intelligent organizations. *Revista Publicando,* 2016, vol. 3 (9), pp. 662–675.
11. Cruz Y.R. Strategic conception of the information and knowledge management for intelligent organizations. *Bibliotecas-Anales De Investigacion,* 2016, vol. 12 (2), pp. 165–181.
12. Bergstein B. From intelligent systems to intelligent organizations. *Research-Technology Management,* 2019, vol. 62 (3), pp. 31–37. DOI: 10.1080/08956308.2019.1587300
13. Anastasi A. Intelligence as a quality of behavior. *What is Intelligence*, 1986, pp. 19–21.
14. Sternberg R.J., Salter W. Conceptions of intelligence. *Handbook of Human Intelligence*, 1982, vol. 1, pp. 3–28.
15. Detterman D.K., Sternberg R.J. (Eds.) *How and how much can Intelligence be Increased*. Praeger, 1982.
16. Wilensky H.L. *Organizational Intelligence: Knowledge and Policy in Government and Industry*. 2015, vol. 19. Quid Pro Books.
17. March J.G., Olsen J.P. *Ambiguity and Choice in Organizations*. Universitetsforlaget, 1979.
18. Quinn J.B. *Intelligent Enterprise: A Knowledge and Service Based Paradigm for Industr.* Simon and Schuster, 1992.
19. Quinn J.B., Anderson P., Finkelstein S. Leveraging intellect. *Academy of Management Perspectives*, 1996, vol. 10 (3), pp. 7–27.
20. Haeckel S.H., Nolan R.A. Managing by wire. *Harvard Business Review*, 1993, vol. 71 (5), pp. 122–132.
21. Liang T.Y. Nurturing intelligent human systems: The nonlinear perspective of the human minds. *Human Systems Management*, 2001, vol. 20 (4), pp. 281–289.
22. Liang T.Y. The inherent structure and dynamic of intelligent human organizations. *Human Systems Management*, 2002, vol. 21 (1), pp. 9–19.
23. McMaster M.D. *The Intelligence Advantage: Organizing for Complexity*. Boston: Butterworth-Heinemann, 1996.
24. Glynn M.A. Innovative genius: A framework for relating individual and organizational intelligences to innovation. *Academy of Management Review*, 1996, vol. 21 (4), pp. 1081–1111.
25. Halal W.E. Organizational intelligence: What is it and how can managers use it to improve performance? *Knowledge Management Review*, 1997, vol. 1 (1), pp. 20–25.
26. Liebowitz J. *Building Organizational Intelligence: A Knowledge Management Primer*. CRC press, 1999.
27. Bollinger A.S., Smith R.D. Managing organizational knowledge as a strategic asset. *Journal of Knowledge Management,* 2001, vol. 5 (1), pp. 8–18. DOI: https://doi.org/10.1108/13673270110384365
28. Guseinova T.N. Innovation production models. *Vestnik MGIMO-Universiteta=MGIMO Review of International Relations*, 2016, no. 3 (48). Available at: https://cyberleninka.ru/article/n/modeli-proizvodstva-innovatsiy (accessed: December 22, 2020) (in Russian).
29. Simsek Z., Heavey C., Veiga J.F., Souder D. A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *Journal of Management Studies*, 2009, vol. 46 (5), pp. 864–894.

30. Ivanova E.V. Technology and its role in the evolutionary development of society. *Vestnik Chelyabinskogo gosudarstvennogo universiteta=Bulletin of Chelyabinsk State University*, 2009, no. 9 (147), pp. 42–45. Available at: https://cyberleninka.ru/article/n/tehnologiya-i-eyo-rol-v-evolyutsionnom-razvitii-obschestva (accessed: December 22, 2020) (in Russian).

31. Myasnikova L. A paradigm shift. New global project. *Mirovaya ekonomika i mezhdunarodnye otnosheniya=World Economy and International Relations*, 2006, no. 6, pp. 3–14 (in Russian).

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Working Conditions as a Factor of Increasing Its Productivity in Russia's Regions*

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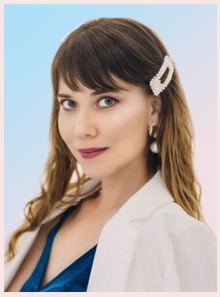

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Abstract. Labor productivity growth depends on various factors: labor potential quality and its use efficiency, improving management and working conditions at enterprises, updating material and technical base of enterprises and introduction of modern technologies in real economic sector, etc. In the study, we considered the impact on labor productivity of such factors as the loss of working time from industrial injuries. It is closely linked to the health-saving problem of working population, as in Russia, according to the statistics there is a super-mortality of working-age population, caused to a certain extent by unfavorable working conditions. The purpose of the study is to analyze the impact of working conditions on its productivity and to assess the potential GRP losses from workers' disability injured at work.

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The research used economic and statistical methods, grouping methods, and comparison methods. The information base for the analysis was the data of the Federal State Statistics Service and sociological monitoring on the assessment of population's qualitative characteristics carried out by the FSBIS VolRC RAS in the Vologda Oblast (no. = 1500). The article analyzes the dynamics of labor productivity in the regions of the Northwestern Federal District in 2005–2018, determines the share of the NWFD regions in the district's total labor productivity, evaluates health impact of employed population on labor productivity both on the basis of sociological data, and by grouping the regions by labor productivity and assessing the level of constant nervous tension, stress, the impact of production factors and other inconveniences of workplaces. The paper calculates the losses of gross regional product from disability time of injured at work. The authors prove that GRP loses from 17 to 26% in the presence of even a small number of disability days of injured at work. The practical significance of the research is to confirm the hypothesis about the influence of working conditions (the basic component of the integral indicator of the quality of working life) on its productivity which gives grounds for developing management decisions to pay special attention to the quality of workplaces.

Key words: labor productivity, working conditions, quality of working life, employed population, industrial injuries, disability days.

Introduction

One of the national goals in modern development period of the Russian Federation is called "decent and effective work", and one of the targets that characterize its achievement by 2030 is "to ensure the growth rate of the country's gross domestic product above the global average while maintaining macroeconomic stability"[1]. The achievement of decent and effective work should be ensured by solving the tasks related to sustainable growth of household incomes and level of pension provision not lower than inflation, real investment growth in fixed assets (at least 70% compared to 2020), real export growth of non-primary non-energy goods (also at least 70%) and an increase in the number of people employed in the field of small and medium-sized enterprises (including individual entrepreneurs and self-employed) to 25 million people.

The researchers note a number of factors the impact of which can negatively affect the implementation of this goal:

– decline in working-age population;

– significant structural and interregional distortions in wages and, consequently, labor productivity;

– labor supply and demand imbalance by type of economic activity;

– presence of a large share of informal employment including shadow employment [1].

The listed risks should include indicators of the quality of labor resources, primarily health of working-age population on which labor return of employees directly depends on.

Deputy Prime Minister of the Russian Federation T. Golikova voiced the importance of workers' health issues at the 3rd Forum of Social Innovations of the Regions. According to her, Russian economy lost more than 200 billion rubles in 2018 due to sick leave; she emphasized that "to develop the economy, first of all, it is necessary to create the most comfortable working conditions,

[1] On the National Development Goals of Russia through to: Presidential Decree of the Russian Federation, dated July 21, 2020. Available at: http://www.kremlin.ru/events/president/news/63728 (accessed: March 01, 2021).

take care of employees, and their health. ... labor productivity is higher in those teams where employees are less ill"[2].

Rospotrebnadzor monitoring on the sanitary and epidemiological state testify the importance of this indicator in the perspective of diseases from unfavorable working conditions. Based on the analysis of environmental factors, it shows that the population of 54 Russian regions (97 million people) lived in 2019 "under the conditions of the greatest influence on the health of factors related to the nature of the territory's industrial and economic development" [2; 3].

A World Health Organization (WHO) study assessing the most common occupational risk factors suggests that at least 1.6% of the disease burden in Europe is determined by working conditions[3]. According to the WHO estimates, workers' health problems, caused by unfavorable working conditions in most countries, make a significant contribution to GNP loss (from 4 to 6%)[4] [4].

The purpose of the research is to analyze labor productivity in the entities of the North-Western Federal District of the Russian Federation including calculation of potential labor productivity losses due to employees' disability associated with unfavorable working conditions.

Theoretical aspects of labor productivity and factors determining it

In general, labor productivity is the ratio of output volume to the amount of the spent labor resources and is calculated to determine the efficiency of functioning individual enterprises, regions, industries, and national economy [5; 6; 7].

Theoretical ideas about labor productivity have been known since the ancient world. However, the theory was formed in the works of the classics of political economy (A. Smith, D. Ricardo). They formulated the concept of "labor productivity", revealed its role in the economy, and identified the main factors affecting its growth. The essence of the concept included not only the rational division and distribution of labor, but also the time factor, the use of technology and employees' skills. "The development of worker's dexterity necessarily increases the amount of work that he is able to perform, and the division of labor, reducing the work of each worker to some simple operation and making this operation the only occupation of his entire life, significantly increases worker's dexterity" [8]. A. Smith put forward the idea of distinguishing unproductive and productive labor. By productive labor he meant labor engaged in material production. A. Smith considered the ability to increase the value of an object, that is, to make a profit, to be the criterion determining productive labor.

D. Ricardo developed A. Smith's ideas in labor theory of value. He believed that the utility of a commodity is necessary for the exchange value availability, and the exchange value source of goods is rarity of the commodity and the amount of labor required for its production [9].

Classics of Marxism-Leninism carried out further elaboration of labor productivity theory. K. Marx significantly developed labor productivity theory with the provision on surplus value: productive is labor that produces surplus value [10].

The development of economic thought in the field of labor was subsequently reflected in two main directions: labor theory of value and theory of production factors which was initiated by J.-B. Say. He identified labor as a separate factor of human activity to give value (utility) to things [11]. Also,

[2] Shabrukova N. The losses of the Russian economy due to sick leave are named. Available at: https://gorodrabot.ru/news/104598 (accessed: March 05, 2021).

[3] Global health risk factors: mortality and disease burden associated with some major risk factors: WHO report. 2015. Available at: www.who.int/evidence/bod (accessed: March 01, 2021).

[4] Poteryaeva E.L. Expert approaches to the diagnosis of occupational diseases: domestic and foreign experience: presentation of the report. Available at: https://irioh.ru/doc/!events/2018/RNZ-2018/01_Poteriaeva.pdf (accessed: March 01, 2021).

representatives of neoclassical economic theory J.B. Clark and A. Marshall made a significant contribution to the science of labor.

Russian literature also gives significant attention to the topic of labor productivity. In the works of scientists of the Soviet period, the Marxist approach prevailed to understanding of productive labor. Modern Russian researchers adhere to the ideas characteristic of Western, primarily neoclassical, economic thought.

A large number of published works are devoted to the study of ***factors that determine labor productivity***. For instance, the work of the American engineer-innovator of production management G. Emerson "The twelve principles of efficiency" is widely known [12]. The implementation of the principles he developed makes it possible to eliminate losses in production activities, to lead to an increase in the efficiency of human activity in general. These are correct work goals, common sense in managing work processes, competence and effective advice on emerging issues in the production and management process, discipline and order, fair and impartial treatment of employees, operational and continuous accounting, dispatching, application of certain principles and schedules, working conditions under which the result of activity will be maximum, rationing of work operations, standard written instructions regarding the order of performance of various works and mandatory performance awards. These principles are still applied in enterprises nowadays. Many of them formed the basis of modern concepts in social and labor sphere, for example, the Scientific Organization of Labor (SOL). So, F. Taylor proposed and justified the labor rationing system as a basis for determining the amount of remuneration for an employee [13], later called the "scientific" system of squeezing sweat" [14]. F. Taylor has proved that the rational organization of labor process, workplaces and labor functions leads to an increase in labor productivity.

Emerson's principles were further developed by H. Fayol, who worked out the basics of rational production management at the beginning of the 20th century [15]. In modern science, they are consonant with the Japanese concept of "lean production" [16]. Lean production concept contains a description of losses, i.e. actions that consume resources, but do not create value for the end user: overproduction, time (waiting), unnecessary transportation, unnecessary processing steps, unnecessary inventory, unnecessary movement, release of defective products. Followers of the theory add to this list the loss of unrealized creative potential of employees. According to P. Drucker, the introduction of new concepts including "lean production" should ensure labor productivity growth in industrial enterprises [17; 18]. We should note that the national project "Labor Productivity and Employment Support", implemented in Russia since 2019, aims to improve the efficiency of domestic companies using lean production tools[5].

The analysis of the scientific literature allows identifying the factors that contribute to increasing labor productivity. A number of studies using mathematical models have determined that labor productivity growth can be due to the level of population's well-being and quality of life and even the number of technical universities in the region [19]. The authors also highlight the capital ratio of labor, investments in fixed assets, foreign investments, the number of state employees of territorial authorities of federal executive bodies, and wages [20].

According to the researchers, the use of more advanced equipment and technologies, improvement of the system of production organization and management, and employees' professional development lead to an increase in labor

[5] Project "Labor Productivity". Available at: https://www.economy.gov.ru/material/directions/nacionalnyy_proekt_proizvoditelnost_truda/ (accessed: March 11, 2021).

productivity [21]. Along with material and financial resources, human resources play a significant role in growing labor productivity. The economy is forced to "consider a man as an active factor in production process" [22].

Labor intensity increase, which is the amount of physical and mental effort applied by the employed population in the course of labor activity, also leads to labor productivity growth. At the same time, labor intensity, having a physiological limit to the consumption of human energy, requires to create a favorable working environment, safe working conditions, an acceptable level of severity and tension of labor process, a positive moral and psychological climate in team, etc. [23].

E. Mayo noted that labor productivity increase is promoted by moral and psychological climate in team which at the same time acts as one of the criteria for job satisfaction [24]. Satisfaction with work, which appears as a result of improving employee's working conditions, in turn, affects labor productivity growth, as the studies of J. Siegal and D. Bowen show it [25]. The content theory of F. Herzberg notes the importance of hygienic factors as poor working conditions and low wages lead to a person's dissatisfaction with their work[6]. Russian researchers also come to the same conclusions saying that the effect of this factor (job satisfaction) has been decreasing over time. F.N. Ilyasov explains it by close connection between the activities carried out and the significance of changes in working environment for employee [26]. The research of E.S. Uzyakova shows the influence of working conditions and equipment of workplaces on labor productivity growth [27]. As the key factors for labor efficiency growth, the author calls the level of technological development, respectively, both production and jobs; the level of remuneration (motivational aspect); structural changes in the economy and employment structure.

The above determines that one of the factors of labor productivity growth is such an integral indicator as the quality of working life. It reflects the entire complex of employee's working conditions which in one way or another affect the effectiveness of realizing labor potential of the employed population. Within the framework of the research, the content of the definition of "quality of working life" (QWL) includes: remuneration, working conditions, opportunities for career growth, employment stability, psychological climate in labor collective, and social significance of work [28]. Among the above-mentioned aspects, many researchers (both domestic [29] and foreign [30–34] call working conditions the key factor and at the same time the most problematic area in the QWL assessment. The paper notes that "although wages are important, social conditions often come first in importance", the research establishes that "there is a direct correlation between certain complexes of social conditions of organizations and productivity and quality of staff work" [35].

From the point of view of sanitary and hygienic parameters and their socio-psychological manifestation, almost all concepts and theories of increasing labor productivity include employees' working conditions. In the study, we are interested in employees' health parameters in connection with unfavorable working conditions which have a negative impact on the effectiveness of implementing labor potential. The economic assessment of health at the society level (macro level) can be considered by estimating the underproduction of GDP due to a reduction in working life. At the enterprise level (micro level) – "by assessing the loss of working time due to diseases and injuries, the additional costs associated with payment of sick leave, the costs associated with finding a replacement for an sick employee", etc. [36]. According to I.B. Nazarova, for example,

[6] Galyautdinov R.R. Content theories of motivation: an overview. Available at: http://galyautdinov.ru/post/soderzhatelnye-teorii-motivacii (accessed: March 11, 2021).

the "ideal model of self-preserving behavior of the employed" is based not only on healthy lifestyle and prevention of diseases with timely access to a doctor, but also on the possibility of choosing safe jobs or, in the absence of a choice, jobs with a minimized impact of negative factors (risks) [37]. T.V. Chubarova, analyzing the main forms of employers 'participation in the protection of workers' health, puts special emphasis on the need for interaction between employers and the state in the issue based on mutual interest in modern economy development [38]. The work of N.A. Lebedeva-Nessevri is devoted to the problem of deterministic health losses of Russia's economically active population [39].

Materials and methods

Information base of the research is based on documentary sources of federal and regional authorities, data from the Federal State Statistics Service, databases of the Unified Interdepartmental Statistical Information System (UISIS), as well as Russian RBC media holding.

Methodological basis is the approaches and scientific results of Russian and foreign authors on the problem of finding reserves for labor productivity growth.

The research uses general scientific and special methods. To study the regional characteristics of the dynamics of labor productivity and some aspects of the quality of working life, the paper uses methods of analysis and diagnostics, and a comparative method to assess the current situation.

The authors carried out calculation of labor productivity by the ratio of gross regional product (mil. rubles) and the average annual number of employees (thou. people) in the region's economy.

$$Q = \frac{V}{L}, \quad (1)$$

where Q – level of average annual labor productivity, thou. rubles/person; V – gross regional product value, mil. rubles; L – average annual number of employees, thou. people.

To assess the impact of health on workers' productivity, the work uses a sociological method. The article presents data on monitoring the quality of labor potential of the Vologda Oblast population in 2020. Surveys have been conducted in Vologda and Cherepovets and 8 districts of the Vologda Oblast since 1996. The sample size is 1500 respondents. The method of assessing health impact on labor productivity was to allocate on the basis of the question "How often and seriously do you get sick?" *(Tab. 1)* the following groups:

– *conditionally healthy employees* (answer position: once a year and less often; never);

– *often ill workers with disability requiring sick leave* (response position: very often due to the weather, etc.; quite often (several times a year));

Table 1. How often and seriously do you get sick?

Possible answer	Very often, due to the weather, etc.	Quite often (several times a year)	Once a year or less often	Never
Ailments (headaches, general weakness, exacerbation of chronic diseases, injuries, wounds, etc.) that quickly pass under the influence of massage, medications, or by themselves, do not reduce the ability to work in general	*Often sick employees with disability with no sick leave*		*Conditionally healthy*	
Ailments that reduce the ability to work normally, but with no sick leave				
Diseases that lead to the loss of the ability to work in the workplace, study, etc., but do not deprive you of the opportunity to engage in self-service, do household chores, cook food, etc.	*Often sick employees with disability with sick leave*			
Diseases that are bedridden, leading to a complete loss of capacity, require service from relatives or other people: nurses, etc., treatment in a sanatorium				

– *often ill workers with disability that does not require a sick leave* (response position: very often due to the weather, etc.; quite often (several times a year).

Further, we have compared the value judgments of the selected groups of employees and their self-assessment of labor productivity on the basis of an average score on a 10-point scale.

The work also used data on the assessment of working conditions of the Rosstat statistical observation "Comprehensive assessment of living conditions" (a 2018 study; possible answer to the question about working conditions: I constantly experience nervous tension, stress, exposure to harmful production factors, and other inconveniences at my main job).

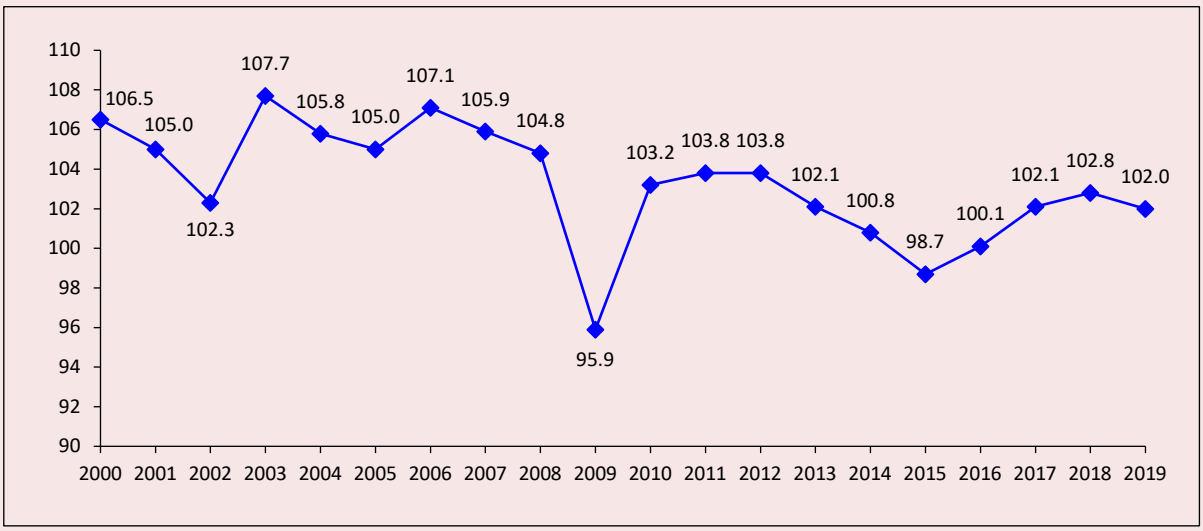
Results and discussion

Data from the Organization for Economic Cooperation and Development (OECD) show that labor productivity in Russia is still several times behind the level of developed countries despite some growth by 2017 ($26.5 per hour, while the leader in labor productivity (Ireland) has this indicator 3.8 times more and is about $99 per hour[7]).

According to Rosstat, the labor productivity index in Russia as a whole in 2000–2019 decreased from 106.5 to 102%. Its significant decline in 2009 and 2015 is particularly clearly demonstrated by the impact of the crisis phenomena in the economy in previous years *(Fig. 1)*.

However, the dynamics of labor productivity index does not give an idea of absolute labor productivity indicators, so in the study, the average annual labor productivity indicator is calculated as the ratio of gross regional product (mil. rubles) and the average annual number of employees (thou. people). The analysis of changes in absolute labor productivity indicators, conducted in the entities of the Northwestern Federal District *(Tab. 2)*, showed that over the thirteen years (2005–2018), labor productivity have tended to grow, both in the federal district as a whole and at the level of its individual regions. During the analyzed period, labor productivity increased by an average of

Figure 1. Dynamics of labor productivity index in RF, % of the previous year



Source: Rosstat data.

[7] Russia is 3.8 times behind Ireland in terms of labor productivity: RBC data. 2019. Available at: www.rbc.ru/economics/05/02/2019/5c5872889a794725eb8d815e (accessed: April 08, 2020).

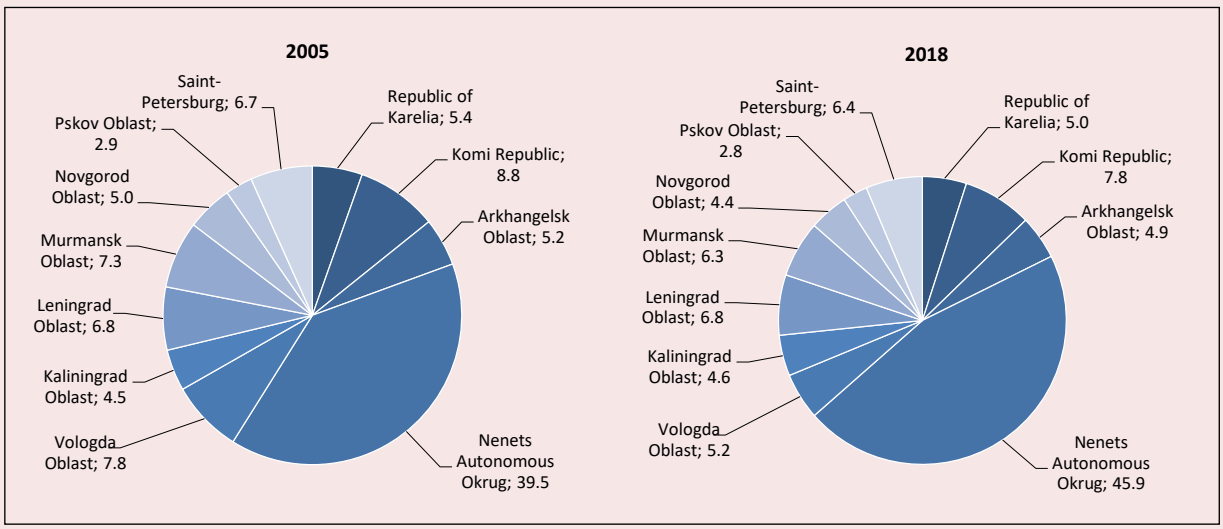
Table 2. Dynamics of average annual labor productivity of the NWFD entities in 2005–2018, thou. rub. / people per year (in comparable prices)

RF entity	2005	2010	2013	2014	2015	2016	2017	2018	2018 to 2005, times
Northwestern Federal District	267.1	299.4	346.4	334.4	360.6	369.2	386.8	428,2	1.60
Republic of Karelia	221.0	214.6	277.1	271.7	272.6	282.8	318.6	349,0	1.58
Komi Republic	360.7	414.2	479.4	446.8	440.8	449.9	485,5	547.5	1.52
Archangelsk Oblast	212.1	231.1	281.0	277.3	278.5	286.7	316,1	346.6	1.63
Nenets Autonomous Okrug	1614.4	2484.2	2381.4	2308.5	2491.4	2659.7	2929,6	3227.5	2.00
Vologda Oblast	320.2	238.6	284.4	287.8	315.6	297.1	325,8	369.5	1.15
Kaliningrad Oblast	183.2	223.5	265.9	271.0	267.1	280.1	303,0	322.9	1.76
Leningrad Oblast	278.9	324.0	367.8	343.9	368.4	387.1	423,1	477.1	1.71
Murmansk Oblast	298.0	309.0	347.3	341.8	382.7	394.4	420,4	445.9	1.50
Novgorod Oblast	203.4	223.8	266.1	283.7	286.2	286.8	323,2	309.8	1.52
Pskov Oblast	120.6	155.1	167.5	165.0	167.1	173.2	187,4	195.3	1.62
Saint-Petersburg	274.6	318.3	366.2	348.7	390.8	399.5	420,4	447.4	1.63
Source: authors' calculations based on Rosstat data.									

1.6 times. In most regions (Arkhangelsk Oblast, Nenets Autonomous Okrug, Kaliningrad Oblast, Leningrad Oblast, Pskov Oblast, St. Petersburg), the growth rate was slightly higher than the average for the Northwestern Federal District. The largest increase in labor productivity was in the Nenets Autonomous Okrug (2 times) and the Kaliningrad Oblast (1.76 times). The Vologda Oblast showed the lowest growth; its labor productivity indicator remained almost unchanged (the increase was 15%).

Figure 2 shows the share of the regions of the Northwestern Federal District in the total labor productivity for the district. The share of the Nenets Autonomous Okrug is significant (39.5% in 2005 and 45.9% in 2018). This is due to the fact that it is

Figure 2. Share of regions in total volume of labor productivity in the Northwestern Federal District in 2005 and 2018, %



Source: authors' calculations based on Rosstat data.

characterized by a single-industry economy with a high share of oil and gas resources production and a relatively small number of employed people (31.8 thou. people in 2018).

Also in 2018, the research noted a significant share of the Komi Republic (7.8%), the Leningrad Oblast (6.8%), St. Petersburg (6.4%) and the Murmansk Oblast (6.3%) in total labor productivity of the district. At the same time, the high level of labor productivity in the Komi Republic and the Murmansk Oblast is provided by the effects of extractive industries (in the Komi Republic, the structure of the economy is dominated by the extraction of hydrocarbons, in the Murmansk Oblast – the extraction of metal ores and non-metallic minerals, as well as a large volume of the fishing industry). St. Petersburg and the Leningrad Oblast are distinguished by a diversified economic structure where one of the leading industries is manufacturing and mechanical engineering. The Pskov Oblast has the lowest share in the total volume (2.8%). The share of the Vologda Oblast was 5.2% in 2018 which is due to the predominance of manufacturing industries in the structure of its economy (metallurgical production, production of chemicals and chemical products, wood processing and production of wood and cork products, production of finished metal products, food production).

We can assume that the industrial structure of the regional economy has a significant impact on labor productivity [42]. However, being largely decisive, it is not the only factor explaining the differences in the levels of labor productivity in the entities of the Russian Federation.

As mentioned above, the quality of working life, in particular its main component – working conditions, which affect the health of workers and their ability to work, can affect the level of labor productivity in the region. To confirm this hypothesis, we have used data from sociological monitoring of the quality of labor potential of population that have been carried out by the Vologda Research Center of the Russian Academy of Sciences in the Vologda Oblast since 1996.

In order to assess the impact of health on labor productivity, we have identified, as mentioned above, groups of workers according to frequency and severity of diseases (conditionally healthy, ill with disability and without disability). The calculations showed that the highest level of self-assessment of labor productivity is typical for a group of conditionally healthy workers *(Tab. 3)*, and in comparison with the data of 2011, value judgments have significantly increased.

Although, at first glance, the differences in the estimates of labor productivity between the selected groups are small, we still assume that often sick workers with disability are forced to hard and difficult to catch up, fight for workplace preservation, etc. This determines their hard work and, accordingly, a fairly high self-esteem. At the same time, data clearly show that healthy workers use their labor potential more effectively.

Table 3. Self-assessment of labor productivity
(the case of the Vologda Oblast), average score on a 10-point scale

Indicator	2011			2020		
	Conditionally healthy	Often sick		Conditionally healthy	Often sick	
		With disability	With no disability		With disability	With no disability
Number of categories in the sample, people (%)	*593 (39.5)*	*897 (59.8)*	*344 (22.9)*	*510 (34.0)*	*984 (65.6)*	*374 (24.9)*
Average score	7.2	7.1	7.2	8.5	8.3	8.4
Source: monitoring data "Quality of labor potential of the Vologda Oblast population", 2011–2020.						

Table 4. Dynamics of judgments of the Vologda Oblast working-age population on barriers in realization of labor potential, %

Possible answer	2016			2020		
	Conditionally healthy	Often sick		Conditionally healthy*	Often sick	
		With disability	With no disability		With disability	With no disability
Poor working conditions	8.4	7.8	7.4	7.5	10.2	6.8
Inconvenient work schedule	7.8	10.2	9.1	6.4	8.8	6.8
Intense team atmosphere	4.3	6.0	6.5	5.9	5.7	4.8
Health problems	4.3	16.2	21.2	5.1	15.4	12.7
Inability to influence enterprise's management	7.6	8.4	9.1	4.8	7.2	7.5
Low labor intensity	5.3	4.7	3.5	4.6	1.9	1.4
Poor relations with management	1.4	3.1	3.0	2.1	3.3	3.4
Other	3.5	2.1	2.2	0.5	0.9	1.0
Not sure	37.1	30.7	26.8	43.2	35.9	40.8

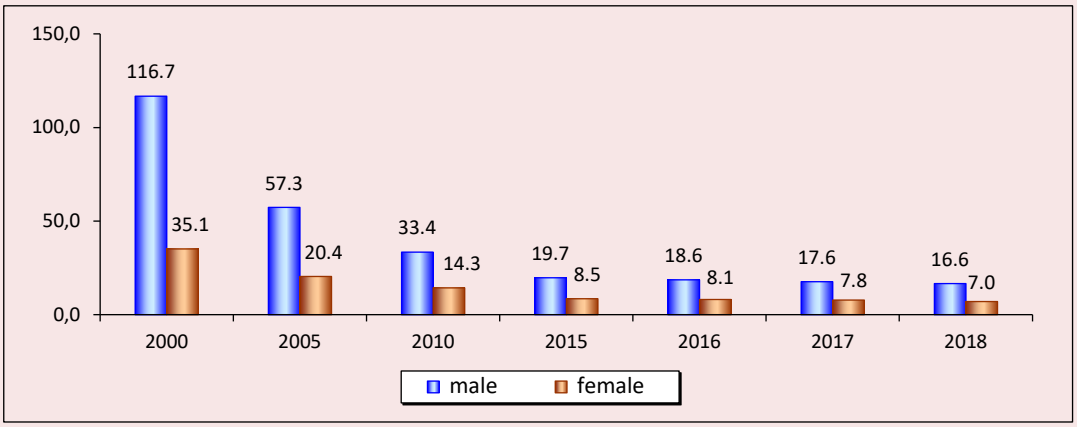
* Ranked by "conditionally healthy" column in 2020.
Source: monitoring data "Quality of labor potential of the Vologda Oblast population", 2016–2020 гг.

Most of all, problems, related to labor productivity, arise due to the poor health of employees *(Tab. 4)*. At the same time, the greatest problems were noted five years ago by a group of often sick workers with no disability, i.e. without registration of a sick leave (21%), in 2020, a group of employees who often take a sick leave (15%) pointed to health-related interference. We should note that healthy workers are more often referred to as a barrier to effective realization of labor potential as a factor of "unfavorable working conditions" (8.4% in 2016, 7.5% in 2020).

One of the indicators reflecting unfavorable working conditions as the main component of the quality of working life is the proportion of injuries of industrial accidents, as well as the number of man days of their disability.

Figure 3 shows that the greatest injury risk is characterized by male economic activities. In the early 2000s, the number of men injured in the workplace exceeded the corresponding figure among women by more than three times. The authors should mention that the dynamics of the number of workers affected in the workplace has

Figure 3. Number of injuries of industrial accidents in RF, thou. people



Source: data of the Federal State Statistics Service. Available at: www.gks.ru

a positive trend. By 2018, the number of male injuries decreased by 10 times (to 16.6 thou. people), the number of female injuries – by 5 times (to 7 thou. people).

The total number of man days of disability for those affected at work has decreased by more than 3.5 times since 2000. However, this indicator per 1 injured increased by more than 1.5 times *(Fig. 4)*.

According to the results of a Comprehensive monitoring of population's living conditions (Rosstat), the regions are characterized by different level of employees' perception of the presence in the workplace of situations of nervous tension, stress, adverse effects of production factors and other inconveniences. For instance, in 2018, 19.5% of employees in the Russian Federation constantly experienced nervous tension and stress at work, 18.6% – exposure of harmful industrial factors, and 11.4% of respondents indicated the constant presence of such inconveniences as cold, damp, etc. Given that the regions are also differentiated by labor productivity level (for example, the difference between the Republic of Komi and the Pskov Oblast is 2.8 times), the question arises about the relationship between labor productivity and estimates of the level of constant nervous tension, stress, the impact of production factors and other inconveniences.

To answer this question, we will group the regions of the Northwestern Federal District according to these criteria. To do this, we determine the optimal number of groups using the Sturges formula:

$$n = 1 + 3{,}322 lg N, \qquad (2)$$

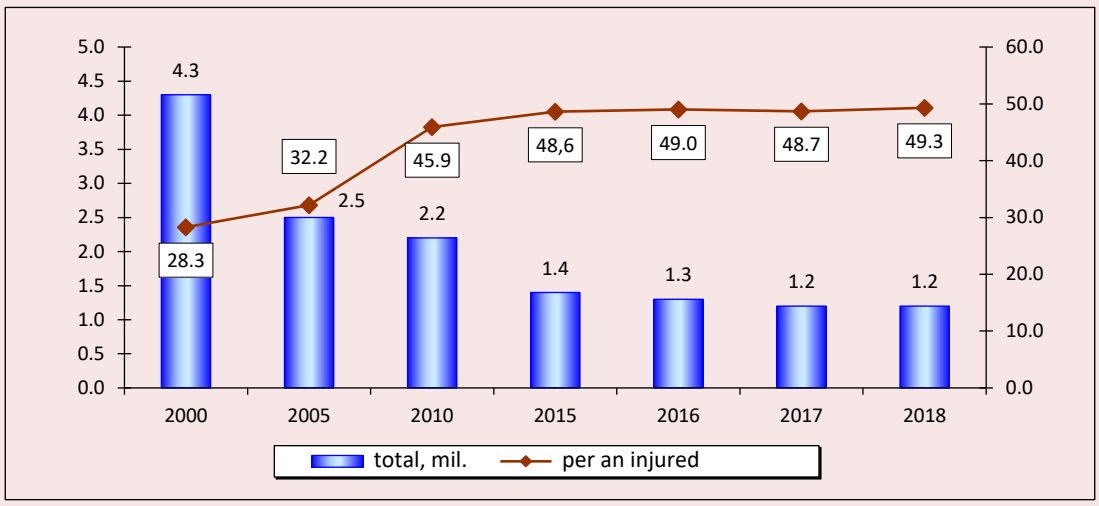
where n – number of groups;

N – number of population units.

The Northwestern Federal District includes 11 regions ($N = 11$), then the optimal number of groups (n) will be 4.4. As fluctuations in the value of labor productivity are low, we have identified 4 groups (with low, average, above average and high levels of labor productivity and levels of constant exposure to production factors).

To assign the region to a particular group, we have calculated the arithmetic mean based on three features that characterize working conditions: constant nervous tension, stress, exposure

Figure 4. Number of man days of disability for industrial injuries in RF



Source: data of the Federal State Statistics Service. Available at: www.gks.ru

Table 5. Impact matrix of unfavorable working conditions on labor productivity level in the regions of the Northwestern Federal District

Level assessment of constant nervous tension, stress, exposure to production factors and other inconveniences of workplaces	Labor productivity of the NWFD regions			
	High	Above average	Average	Low
High		Komi Republic	Archangelsk Oblast Vologda Oblast	
Above average	Nenets AO	Murmansk Oblast		Pskov Oblast
Average			Republic of Karelia Kaliningrad Oblast	Novgorod Oblast
Low		Leningrad Oblast St. Petersburg		

Source: authors' calculations based on Comprehensive Monitoring of living conditions of population (Rosstat). Available at: https://gks.ru/free_doc/new_site/KOUZ18/index.html (accessed: March 19, 2021); *Regions of Russia. Socio-economic indicators. 2020: stat. coll.* Rosstat. Moscow, 2020. 242 p.

of harmful production factors, and presence of other inconveniences. According to the results, the leading positions in this indicator are the Komi Republic, the Arkhangelsk and Vologda oblasts, the employed population of which, to a greater extent than in other regions, note unsatisfactory working conditions.

Comparing the estimated features of jobs and labor productivity level in the regions of the Northwestern Federal District *(Tab. 5)*, we can see that the presence of jobs, characterized by situations of nervous tension, stress, adverse effects of production factors and other inconveniences[8], affect the economic activity result. For instance, with the level of unfavorable background of jobs above average, the Pskov Oblast is in the group of regions with a low level of labor productivity, and the Leningrad Oblast and St. Petersburg, having a low level of stress and other negative factors in the workplace, occupies places in the group with above average level of labor productivity. It means that in regions with a high level of unfavorable working conditions, according to population estimates[9], there is a lower level of labor productivity. We should note that such trends are not observed in all regions (for example, with fairly high estimates of unfavorable working conditions in the Nenets Autonomous Okrug, labor productivity is high which is due to a single-industry economy with a high share of extractive industries). However, we assume that for more fundamental conclusions, it is necessary to analyze a larger number of survey points (in this case, we limited ourselves to one federal district in one year).

Industrial injuries are directly related to poor working conditions and occupational safety. Inattention to these factors leads to significant losses in the economy [15]. To confirm this assumption, we calculate possible damage to the economy of each of the NWFD entities from the number of man days of disability, i.e., we determine by how many percent of labor productivity level can decrease with decline in the gross regional product due to the disability of employed population. GRP losses from disability days of injured at work will be calculated according to the following formula:

[8] Working conditions. Comprehensive monitoring results of population's living conditions. Available at: https://gks.ru/free_doc/new_site/KOUZ18/index.html (accessed: March 19, 2021).

[9] The research uses the position of population's responses "I constantly experience nervous tension, stress, exposure to harmful production factors and other inconveniences (cold, damp, etc.)".

$$L_{grp} = \frac{GRP}{247} \times DA, \quad (3)$$

where:

L_{grp} – losses of gross regional product (*GRP*);

GRP – gross regional product;

247 – number of working days in 2018 according to production calendar;

$\frac{GRP}{247}$ – average daily output per employee;

DA – number of days of disability of injuries at work.

The calculation has proved that GRP loses from 17 to 26% in the presence of even a small number of disability days of industrial injuries, *(Tab. 6)*.

The largest losses of gross regional product are in the Pskov Oblast (26.3%). The largest number of disability days (65 days) of injuries is recorded in industries characterized by a high level of injuries (production of non-metallic mineral products, mechanical engineering and metalworking). At the same time, the Pskov Oblast does not have the highest share of workers engaged in work with harmful and (or) dangerous working conditions (35%; *Tab. 7*). Accordingly, in this region, it is necessary to pay attention to labor safety.

The lowest indicators of losses from industrial injuries among the regions of the Northwestern Federal District are observed in the Republic of Karelia and the Vologda Oblast (on average, it is 3 percentage points lower than in the district).

Thus, the increase in labor productivity can be achieved by significantly reducing industrial injuries and losses from disability of injuries at work. The most important is to pay attention to labor safety and security, minimizing stress and other adverse factors of workplace, and generally improving the quality of working life of employees. According to a report by the Wellness Council of America, wellness programs for employees of organizations reduce medical expenses by almost 30% and significantly decline the number of absenteeism, and every dollar spent by a company on improving the employees' health is recouped 24 times[10]. This is all the more important in the context of existing demographic trends the main of which is a gradual decline in the number of working-age population. According to the forecast, the share of this group in the total

Table 6. Calculation of GRP losses in the Northwestern Federal District regions in 2018

RF entity	Actual GRP (in 2018 prices), mil. rub.	Average daily output per 1 employee, mil. rub.	Disability days due to industrial injuries	Losses in GRP, mil. rub.	Share of losses in GRP, %	Potential GRP (in 2018 prices), mil. rub.
Northwestern Federal District	9015190.0	36498.7	*49*	1788439.0	19.8	10803629
Republic of Karelia	280012.4	1133.7	42	47613.4	17.0	327625.8
Komi Republic	665735.7	2695.3	61	164412.5	24.6	830148.2
Archangelsk Oblast	514033.4	2081.1	44	91568.7	17.8	605602.1
Nenets Autonomous Okrug	305213.6	1235.7	50	61784.1	20.2	366997.7
Vologda Oblast	582630.4	2358.8	42	99070.8	17.0	681701.2
Kaliningrad Oblast	460854.9	1865.8	58	108216.9	23.5	569071.8
Leningrad Oblast	1104436.0	4471.4	48	214627.2	19.4	1319063
Murmansk Oblast	482547.9	1953.6	45	87913.6	18.2	570461.5
Novgorod Oblast	262008.0	1060.8	47	49855.8	19.0	311863.8
Pskov Oblast	164228.5	664.9	65	43218	26.3	207446.5
St. Petersburg	4193490.5	16977.7	48	814929.1	19.4	5008419
Source: authors' calculations based on Rosstat data.						

[10] World Health Statistics 2015. Available at: http://www.who.int/gho/publications/world_health_statistics/2015/en/ (accessed: March 23, 2021).

Table 7. Share of employees of organizations of agriculture, forestry, hunting, fishing and fish farming engaged in work with harmful and (or) dangerous working conditions, % of the total number of employees of organizations, without small businesses

Region	Employed in jobs with harmful and (or) dangerous working conditions	
	2017	2018
Northwestern Federal District	40.2	41.6
Murmansk Oblast	71.5	67.9
Archangelsk Oblast	56.9	62.1
Including Nenets AO	45.3	47.7
Vologda Oblast	48.6	48.4
Novgorod Oblast	43.0	46.3
Kaliningrad Oblast	30.0	39.3
Komi Republic	35.4	35.3
Pskov Oblast	30.6	34.7
Republic of Karelia	29.2	27.4
Leningrad Oblast	26.7	27.0
St. Petersburg	31.0	22.8
Source: labor and Employment in Russia, 2019: stat. coll. Rosstat. Moscow, 2019. 135 p.		

population will decrease from 57% in 2017 to 53% in 2027 (or from 83.2 to 78.8 mil. people). In addition, there are serious problems of deterioration of the quality characteristics of population (health, professional and educational, qualification and intellectual potential).

Conclusion

Solving the problem of labor productivity growth is the most important task for all Russian regions. The study proves that it depends on a number of both external and internal factors. The latter are controlled, and, therefore, by influencing them, it is possible to influence labor productivity [41; 42]. Among such manageable factors are safe working conditions as one of the components of the quality of working life. Among the consequences of the lack of safety of working conditions is industrial injuries which are expressed in the number of days of disability for injuries at work. The analysis has showed that, on average, GRP losses range from 17 to 26% of the potential in the entities of the Northwestern Federal District, with the existing level of injuries.

Taking into account the objectives of the national project "Labor Productivity and Employment Support" (development of effective measures to increase labor productivity, dissemination of knowledge in the field of labor productivity improvement, stimulating interest in improving labor productivity on the part of enterprises, regional and federal authorities), heads of enterprises and state authorities should pay attention to improving labor safety. It is necessary to invest in modern equipment or technologies (currently, Russian enterprises have a very high depreciation of fixed assets, about 48%).

We can conclude that improving working conditions as a basic component of the quality of working life has the potential to increase productivity.

Thus, the comprehensive impact assessment of working conditions on productivity allowed gaining new knowledge about the aspects of the quality of working life considered in the regional context, and showed the need to pay special attention to the quality of jobs in developing management decisions.

References

1. *Natsional'nye proekty 2019–2024 gg.: analiz i klyuchevye riski ikh realizatsii. Ekonomicheskii blok: nauch.-analit. Izdanie* [National projects 2019–2024: Analysis and key risks of their implementation. Economic block: Research and analytical publication]. Team of authors under the supervision of RAS corresponding member V.A. Ilyin and Doctor of Sciences (Economics) T.V. Uskova. Vologda: VolRC RAS, 2019. 93 p.
2. *O sostoyanii sanitarno-epidemiologicheskogo blagopoluchiya naseleniya v Rossiiskoi Federatsii v 2019 godu: gosudarstvennyi doklad* [On the state of sanitary and epidemiological well-being of the population in the Russian Federation in 2019: State report]. Moscow: The Federal Service for the Oversight of Consumer Protection and Welfare, 2020. 299 p.
3. Katkova I.P., Rybalchenko S.I. Premature mortality and healthy life expectancy in the context of the national development objectives of Russia. *Narodonaselenie=Population*, 2020, no. 4, pp. 83–92. DOI: 10.19181/population.2020.23.4.8 (in Russian).
4. Korolenko A.V., Kalachikova O.N. Determinants of health of the working population: conditions and nature of work. *Zdorov'e naseleniya i sreda obitaniya=Public Health and Life Environment – PH&LE*, 2020, no. 11, pp. 22–30. DOI: 10.35627/2219-5238/2020-332-11-22-30 (in Russian).
5. Belchik T.A. Labor productivity improvement as the major factor of economic growth. *Vestnik Kemerovskogo gosudarstvennogo universiteta. Seriya: Politicheskie, sotsiologicheskie i ekonomicheskie nauki=Bulletin of Kemerovo State University. Series: Political, Sociological and Economic Sciences*, 2017, no. 2, pp. 29–33 (in Russian).
6. Rachek S.V., Miroshnik A.V. Productivity as key performance indicators work. *Sovremennye problemy nauki i obrazovaniya=Modern Problems of Science and Education*, 2013, no. 6. Available at: http://science-education.ru/ru/article/view?id=11461 (accessed: April 19, 2020) (in Russian).
7. Mirolyubova T.V. Labor productivity in Russian regions: spatial aspects and interrelation with information resources. *Vestnik Permskogo universiteta=Perm University Herald. Economy*, 2016, no. 3 (30), pp. 120–131 (in Russian).
8. Smith A. *Issledovanie o prirode i prichinakh bogatstva narodov* [An Inquiry into the Nature and Causes of the Wealth of Nations]. Moscow: AST, 2019. 1072 p.
9. Ricardo D. *Nachala politicheskoi ekonomii i nalogovogo oblozheniya* [On the Principles of Political Economy and Taxation]. Translated from English by P. Sraffa. Moscow: Eksmo, 2007. 953 p.
10. Marx K., Engels F. *Sochineniya* [Works]. Volume 26. Part 1. Moscow: Gosudarstvennoe izdatel'stvo politicheskoi literatury, 1966. 476 p.
11. Say J.-B. A Treatise on Political Economy; or The Production, Distribution, and Consumption of Wealth. In: Bastiat F. *Ekonomicheskie sofizmy. Ekonomicheskie garmonii* [Economic Sophisms. Economic Harmonies]. Compilation, introduction and comments M.K. Bunkina and A.M. Semenov. Moscow: Delo, 2000. 229 p. (in Russian).
12. Emerson G. *Twelve Principles of Efficiency*. New York: The Engineering Magazine Co, 1913. 449 p.
13. Taylor F.W. *The Principles of Scientific Management*. New York: Harper & Brothers, 1911. 144 c.
14. Lenin V.I. A "Scientific" System of Sweating. In: *Poln. sobr. soch.* [Collected Works]. Moscow: Politizdat, 1973. Vol. 23. Pp. 18–19 (in Russian).
15. Fayol H. *General and Industrial Management*. Constance Storrs, Pitman: London, 1949. 110 p.
16. Taiichi O. *Proizvodstvennaya sistema Toioty: ukhodya ot massovogo proizvodstva* [Toyota Production System: Beyond Large-Scale Production]. Translated from English by A. Gryaznova and A. Tyaglova. 4th ed. Moscow: IKSI, 2012. 194 p.
17. Drucker P. *Druker na kazhdyi den'. 366 sovetov po motivatsii i upravleniyu vremenem* [The Daily Drucker: 366 Days of Insight and Motivation for Getting the Right Things Done]. Translated from English. Moscow: I.D. Vil'yams, 2007. 416 p.

18. Drucker P.F. *The Effective Executive: The Definitive Guide to Getting the Right Things Done (Harper Business Essentials)*. Harper Business. 2006. 208 p.
19. Makarov V.L., Aivazyan S.A., Afanasiev M.Yu., Bakhtizin A.R., Nanavyan A.M. The estimation of the regions' efficiency of the Russian Federation including the intellectual capital, the characteristics of readiness for innovation, level of well-being, and quality of life. *Ekonomika regiona=Economy of Region*, 2014, no. 4, pp. 9–30 (in Russian).
20. Averina T.N., Shishkin A.N., Basovskaya E.N.,.Basovskiy L.E. Labor productivity factors in the region. *Zhurnal ekonomicheskoi teorii=Russian Journal of Economic Theor*y, 2020, vol. 17, no. 1, pp. 225–229. DOI: https://doi.org/10.31063/2073-6517/2020.17-1.18 (in Russian).
21. Afanasyev V.S. *Velikoe otkrytie Karla Marksa: Metodologicheskaya rol' ucheniya o dvoistvennom kharaktere truda* [Karl Marx's Great Discovery. The Dual-Nature-of Labour-Doctrine: Its Methodological Role]. Moscow: Mysl', 1980. 76 p.
22. Lapteva E.V., Ostroumov V.V. N.A. Vitke & School of Human relations. *Upravlencheskie nauki=Management Science*, 2020, no. 10 (3), pp. 78–85. DOI: https://doi.org/10.26794/2404-022X-2020-10-3-78-85 (in Russian).
23. Radosteva M.V. On the question of labor productivity. *Nauchnye vedomosti=Belgorod State University Scientific Bulletin*, 2018, vol. 45, no. 2, pp. 268–272 (in Russian).
24. Mayo E. *The Human Problems of an Industrial Civilisation*. Viking Press, New York, 1960. Pp. 180–189.
25. Siegal J.P., Bowen D. Satisfaction and performance: Causal relationships and mediating effects. *Journal of Vocational Behavior,* 1971, no. 1, pp. 263–269.
26. Ilyasov F.N. *Udovletvorennost' trudom (analiz struktury, izmerenie, svyaz' s proizvodstvennym povedeniem)* [Job Satisfaction (Structure Analysis, Measurement, Connection with Production Behavior)]. Ashkhabad: Ylym (Nauka), 1988. 100 p.
27. Uzyakova E.S. Labor productivity and opportunities for economic growth. *EKO=ECO*, 2020, no. 6, pp. 87–110. DOI: 10.30680/ECO0131-7652-2020-6-87-110 (in Russian).
28. Belekhova G.V. Subjective approach to assessment quality of working life of working-age population of the region. *Nauch. issl. i razrabotki. Ekonomika=Scientific Research and Development. Economics*, 2019, vol. 7, no. 6 (42), pp. 9–19. DOI: 10.12737/2587-9111-2019-9-19 (in Russian).
29. Kozlova O.A. et al. *Kachestvo trudovoi zhizni v regione: voprosy teorii i praktiki upravleniya* [Quality of Work Life in the Region: The Issues of Theory and Practice of Management]. Under the supervision of O.A. Kozlova. Yekaterinburg: IE UrO RAN, 2013. 170 p.
30. Mirvis P.H., Lawler E.E. Accounting for the quality of work life. *Journal of Occupational Behaviour,* 1984, no. 5, pp. 197–212.
31. Roethlisberger F.J., Dickson W.J. *Management and the Worker.* Cambridge: Harvard University Press, 1941. Pp. 615–631.
32. Goode D.A. Quality of life, quality of work Life. In: *Economics, Industry and Disability: A Look Ahead*, 1989. Pp. 337–349.
33. Stephen A. Quality of work life in small scale industrial units. *Employers and Employees Perspectives*, 2012, no. 28 (2), pp. 262–271.
34. Swamy D.R. Quality of work life of employees in private technical institutions. *International Journal for Quality Research*, 2013, no. 7 (3), pp. 3–14.
35. Perfiljeva M.B. Social conditions of managing the quality of working life. *Zhurnal sotsiologii i sotsial'noi antropologii=The Journal of Sociology and Social Anthropology*, 2010, no. 2, pp. 116–125 (in Russian).
36. Popova I.V., Kotlyarova L.D., Kotlyarova O.A. Health of labourers as the factor of the labour efficiency. Problems of measuring. *Vestnik KGU=Vestnik of Kostroma State University*, 2014, no. 6, pp. 284–289 (in Russian).
37. Nazarova I.B. Employed health: Causes of losses and saving opportunities. *Upravlenie zdravookhraneniem=Health Management*, 2007, no. 20, pp. 9–22 (in Russian).

38. Chubarova T.V. Workers' health as a sphere of interaction between the modern state and employers. In: «*Forsait «Rossiya»: novoe industrial'noe obshchestvo. Perezagruzka»: sbornik dokladov Sankt-Peterburgskogo mezhdunarodnogo ekonomicheskogo kongressa (SPEK-2017)* [Foresight Russia. New Industrial Society. Reboot: Collection of Reports presented at the St. Petersburg International Economic Congress (SPEC-2017)]. Ed. by S.D. Bodrunov. St. Petersburg: INIR im. S.Yu. Vitte, 2018. Vol. 2. Pp. 577–587 (in Russian).

39. Lebedeva-Nesevrya N.A., Gordeeva S.S., Solovyev S.S. Microsocial health risk factors for various subgroups of the economically active population of Russia (based on the materials of an all-Russian survey). In: *Aktual'nye voprosy obespecheniya sanitarno-epidemiologicheskogo blagopoluchiya naseleniya na urovne sub"ekta federatsii: materialy mezhregional'noi nauchno-prakticheskoi internet-konferentsii* [Topical issues of ensuring the sanitary and epidemiological well-being of the population at the level of a RF subject: Proceedings of the interregional scientific and practical Internet conference]. Ed. by A.Yu. Popova, N.V. Zaitseva. 2017. Pp. 320–326 (in Russian).

40. Leonidova E.G., Sidorov M.A. Structural changes in the economy: Searching for sectoral drivers of growth. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2019, vol. 12, no. 6, pp. 166–181. DOI: 10.15838/esc.2019.6.66.9 (in Russian).

41. Ilyin V.A., Gulin K.A., Uskova T.V. Strategic reserves of labor productivity growth in the regional economy. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2010, no. 1 (9), pp. 24–38 (in Russian).

42. Uskova T.V., Lukin E.V., Vorontsova T.V., Smirnova T.G. *Problemy ekonomicheskogo rosta territorii: monografiya* [Problems of Economic Growth of the Territory: Monograph]. Vologda: ISEDT RAS, 2013. 170 p.

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The Impact of the New Model of Nuclear Industry Diversification on the Development of the Territories of Presence (Theoretical and Practical Aspects)

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Abstract. The state has set a task to expand the production of high-tech civilian products for the enterprises of the military-industrial complex. Many defense enterprises are located in single-industry towns, which makes it relevant to analyze the mutual influence of the diversification of city-forming enterprises and cities' development. The purpose of the study is to assess the impact of the new model of diversification on the development of the territories of presence in the context of the nuclear industry. The research methodology is based on the principles of system analysis and institutional economic theory. The authors use the methods of analysis, synthesis, induction, deduction, and logical modeling. The basis is the theory of the social contract. The research proposes a three-level model of the social contract, detailing the interaction of an individual with three levels of public power – federal, regional, and local. The feature of

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the municipal part of the social contract for single-industry towns is highlighted: its third party is the city-forming enterprise that creates a number of basic benefits. In single-industry towns, where the nuclear industry enterprises are the main city-forming enterprises, the municipal part of the social contract changes: a state corporation becomes one of the contract parties instead of a city-forming enterprise. This is due to the introduction of a new model of diversification of the state corporation's activities. The authors prove that changing the social contract can give the cities of presence new qualified jobs, and state corporations can help to form a personnel reserve, fulfill the goals in the field of defense production diversification and the creation of new high-tech businesses. Testing the modified model of the social contract on the example of closed administrative-territorial entities of the nuclear industry revealed local governments' and the population's interest in it, the possibility of cities' long-term sustainable development, including improving the comfort of living. The results of the study can be used to develop strategic documents for spatial development, programs for single-industry towns' development, city-forming enterprises and holdings in various industries.

Key words: social contract, single-industry town, closed administrative-territorial formation, city-forming enterprise, diversification of the military-industrial complex, State Corporation Rosatom.

Introduction

The policy of increasing the share of civilian production by the military-industrial complex (MIC) enterprises announced by the President of the Russian Federation[1] has significantly intensified scientific interest in this topic in recent years. The fundamental need to diversify the defense industry is in no doubt, which among other things is confirmed by extensive international experience [1; 2]. At the same time, the certain aspects of this process have been studied to a different extent. In particular, the issue of the impact of the diversification of the activities of defense enterprises, which are the city-forming ones in single-industry towns, on the development of the territories of their presence has not yet been sufficiently worked out.

This problem is relevant and has serious practical significance, since by 2030, defense enterprises should increase the output of civilian products to 50% of the total output. There is a need for a "bundle" of the issues of diversification of the defense industry and the development of their territories, which are mainly studied separately.

The issue reflecting the author's approach to the problem under study and raised in the article can be considered as one of the aspects of a broader topic – the spatial location of high-tech production and science, causing a certain disagreement even in the basic strategic documents. Thus, the Scientific and Technological Development Strategy of the Russian Federation indicates the need to "support *individual territories* with a high concentration of research, development, innovation infrastructure, production"[2]; the Strategy of Spatial Development of the Russian Federation presumes the development of high-tech industries, as well as advanced research and innovation infrastructure (including unique scientific installations of the mega science class) only in *large and largest urban agglomerations*[3]. However, mega science class installations available in Russia (the NICA collider in Dubna, the UFL-2M laser installation in Sarov,

[1] Presidential Address to the Federal Assembly dated December 01, 2016. Available at: http://www.kremlin.ru/acts/bank/41550 (accessed December 16, 2020).

[2] Scientific and Technological Development Strategy of the Russian Federation, approved by Executive Order of the President of the Russian Federation dated December 1, 2016 No. 642.

[3] Spatial Development Strategy of the Russian Federation for the period up to 2025, approved by the order of the Russian Government dated February 13, 2019 No. 207-R.

etc.), and in other countries (for example, large scientific installations in US national laboratories[4]) can and should (due to their size, special operating conditions, etc.) be located outside of large cities and agglomerations. In addition, the focus on the development of fundamental science is one of the priority forms of diversification of defense research institutes, some of which are located in closed cities.

The author's approach determined the purpose of the study, which is to assess the impact of the new model of nuclear industry diversification on the development of the territories of presence in theoretical and practical terms. The theoretical aspects of the work detail the theory of the social contract (justification of the three-level model of the social contract, highlighting its features at the municipal level, in particular in single-industry towns and closed administrative-territorial entities (CATE)). The model connects the study of the issues of defense and other organizations diversification, that is, the development of city-forming enterprises and industries, and the development of the territories of presence. The paper considers the changes in the municipal part of the social contract, which consist in replacing the city-forming enterprise with a state corporation as one of the parties to the contract in single-industry towns (in particular in CATE), where the city-forming enterprises are the enterprises of the state corporation Rosatom.

Review of the previous studies

Studies of the social contract, as a development of the social contract idea, have been in the scientists' field of attention for more than one century. Within the framework of this paper, it is of interest to detail the social contract, to highlight the expectations and obligations of the individual in relation to the three levels of public power – federal, regional and local, which are more often called macro-, meso - and micro-levels of the social contract [3]. In contrast to the "regional contract", which mainly deals with the relations between regional authorities and business [4], the municipal contract is a "model based on a social contract between the population and the municipal authorities" [3]. Foreign studies pay attention to the "new social contract" developed in the changed conditions of an open economy and society, including the peculiarities of the local contract for different societies[5], states, cities [5], as well as in the conditions of changing technologies and the widespread introduction of artificial intelligence [6]. In the domestic economic discourse, a detailed approach to the consideration of the social contract is still only beginning to develop. The strategic interest in the study of social phenomena using the social contract model is emphasized by its importance for the development of human capital, since it is "competition for high-quality human capital ... that will determine the country's position in the global economic turnover in the 2020s" [7]. This focus is important for our work, as it considers industries and cities where high-tech areas of activity are concentrated.

The problems of single-industry towns' development are the field for numerous studies of scientists such as economists, sociologists, geographers, historians, etc. The main problems include the dependence of the labor market on the city-forming enterprise, the prevailing influence of external economic processes on all spheres of life of the city; the outflow of the economically active population that does not fit into the activities of the city-forming enterprise, or in connection with its unstable activities; the dependence of the municipal budget on the results of the city-forming enterprise, etc. [8].

[4] Office of Science. Acknowledging User Facilities. URL: https://science.osti.gov/User-Facilities/User-Resources/Acknowledging-User-Facilities (accessed June 11, 2020).

[5] Krupansky J. Elements of a Social Contract. 2017. URL: https://jackkrupansky.medium.com/elements-of-a-social-contract-69572b4bba11 (accessed April 12, 2021).

As for closed cities, the scientific discussions of recent years have focused more on the legal regime of CATE [9], the peculiarities of local self-government there and the budget process. These approaches are necessary to complement the consideration of CATE as centers of innovative development [10].

In scientific research [11, pp. 12–14] and in state strategizing[6], a popular recipe for avoiding the single-industrialization of the city for a certain time was the diversification of the economy through the development of small businesses that are not associated with the city-forming industry. Today, more and more attention is paid to the need for a differentiated approach to the diversification of the economy of single-industry towns [12; 13], focusing on the strategic priorities of the country's development in this process [14]. The issues of the development of single-industry towns have become more often considered through the prism of the activities of the city-forming enterprise [15, pp. 44–46], including (although still rare) through the possibility of diversifying its activities [16]. Such an approach (the development of single-industry towns using of the opportunities of the city-forming industry or enterprise, and not just diversification or liquidation) is presented in the works of foreign authors [17; 18]. As a result, the research showed interest in the topic of social responsibility of large businesses in the territories of their presence [19] and the transition of this function from individual enterprises to the level of holdings [20]. At the same time, the researchers note that the issues of integrated development of the territories of presence are still in the field of view only of state corporations [21]. The Russian authors pay their attention to the research of scientific and technological [22], organizational [23], state-regulatory [24] functions of state corporations, leaving the analysis of their city-forming significance in the shadow.

The interest in the city-forming function of state corporations in this paper is due to the fact that the diversification of defense industries is more effective within the framework of a holding company or a state corporation [25; 26]. However, the connection between the diversification of defense enterprises, including those within state corporations, and the diversification of the economy of single-industry towns (territories of presence) has not yet been properly reflected in the scientific literature.

Materials and methods of the study

The research methodology is based on the principles of system analysis and institutional economic theory. The authors use such general scientific methods and techniques as analysis and synthesis, induction and deduction, and apply the method of logical modeling. The theoretical basis of the study was the theory of the social contract. The social contract is a triune one, because the individual expects some benefits from the state as a whole, fulfilling their obligations to each of the levels of government – federal, regional, and local. From a formal point of view, this is a certain simulation of the situation, since local self-government bodies (LSGB) are not included in the system of state power (Article 12 of the Constitution of the Russian Federation). However, both the federal, regional, and local authorities, within the limits of their powers, are engaged in the creation of public goods, which from the citizen's point of view allows us to present them as three levels of public power. The article deals with the municipal part of the social contract, in which the resident expects at least the following benefits from the local government: the opportunity to work and earn; comfortable living conditions, including the organization and provision of social benefits; protection of property rights; personal and property security; opportunities to meet social, cultural and economic needs. In

[6] Priority Program "Integrated Development of Single-Industry Towns" (the program passport was approved by the Presidium of the Presidential Council for Strategic Development and Priority Projects (Protocol No. 11 dated November 30, 2016)). Recognized by the Accounting Chamber as ineffective, and closed prematurely in 2019.

single-industry towns, the social contract includes a third party – the city-forming enterprise, since it creates such an important benefit as jobs (both for residents and for local authorities); it provides increased wages (trade, services, etc. develop as an external effect); develops the cultural, sports, and recreational opportunities in the city by owning the relevant facilities, etc. In political terms, the city-forming enterprise forms strong social groups (management and staff, trade unions, etc.), which are of serious, sometimes key, importance in the city. A special feature of the municipal part of the social contract in CATE is the presence of formal rules[7], according to which the local government transfers part of its powers to the city-forming enterprise, thereby sharing responsibility for the decisions made and the results achieved in the context of the socio-economic development of the territory.

The study was based on closed administrative-territorial entities with city-forming enterprises of the nuclear industry. The choice of these cities is determined by the concentration of intellectual resources, technologies, experimental and industrial base there. Formally, not all "nuclear" closed cities are included in the list of single-industry municipalities[8], but their actual dependence on the enterprises of the nuclear industry makes it possible to consider them as single-industry towns. We believe that this approach is necessary, because all the problems of single-industry towns are inherent in all of them, and the development of solutions for the development of their economy cannot be carried out without taking into account the influence of the city-forming industry. Approbation of the theoretical provisions of the study was carried out by analyzing the socio-economic situation in the region, identifying development trends, comparing them with theoretical conclusions.

The information base of the research was the official data of the Federal State Statistics Service of the Russian Federation, the authorities of the subjects of the Federation, local self-government bodies of the cities under consideration (indicators for assessing the effectiveness of the activities of local self-government bodies for the relevant years, reports of the cities' heads, strategies for the socio-economic development of the Russian Federation, reports on budget execution). Data on the activities of the State Corporation Rosatom are taken from the annual reports published on its official website.

Results

Currently, more than 40 localities in the Russian Federation have CATE status. In ten of them, the city-forming organizations are nuclear industry organizations. In addition to CATE, the enterprises of the State Corporation Rosatom are city-forming in 16 more cities. Among the city-forming enterprises, there are both defense and strategically important civilian enterprises.

The modern model of activities diversification of the State Corporation Rosatom, which we call the "new model" (for more information, see [27]), began to form in 2014. The main reasons for this are the following: 1) the need to increase the production of civilian products by defense enterprises, the use of their potential for the development of the domestic high-tech industry; 2) ensuring the stability of defense enterprises' activities in case of a decrease in the state defense order (SDO); 3) managing the corporation's product portfolio in the main non-defense sector – nuclear energy, since there are serious risks associated with the policy, activity of foreign competitors, changes in technology, etc.; 4) fulfilling the tasks of the state industrial, scientific, technical, social and regional policy, which implies the status of a state corporation. The model is based

[7] The formal rules are defined in the Law of the Russian Federation dated July 14, 1992 No. 3297-1 "On closed administrative-territorial entity", in particular, participation in the appointment of the head of the local administration (through the federal executive authority, which is responsible for the enterprise located in the city), participation in activities to ensure access control, etc.

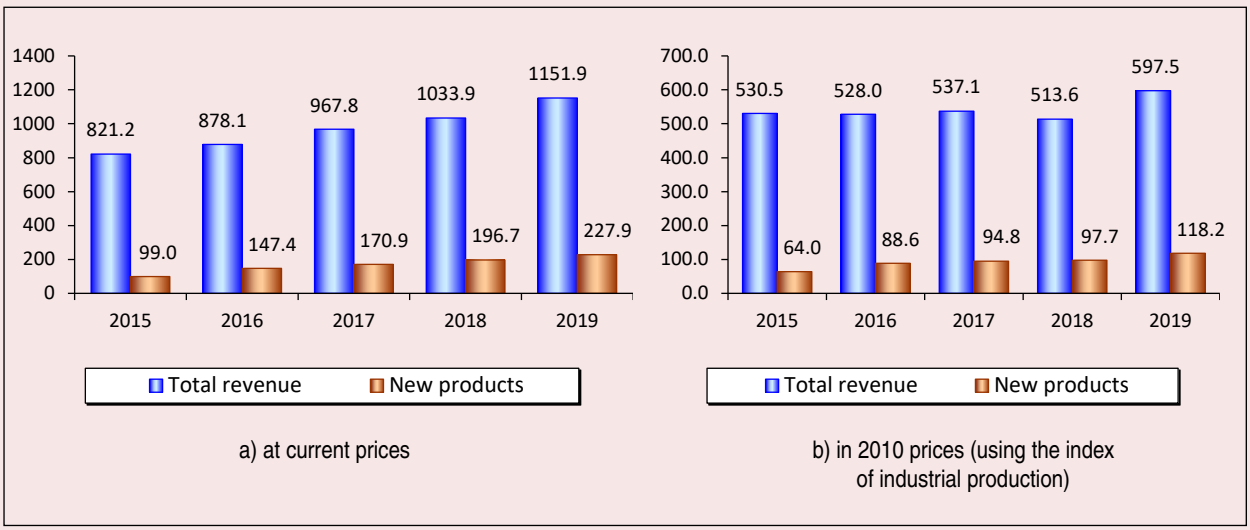
[8] Decree of the Government of the Russian Federation No. 1398-r dated July 29, 2014 "On the list of single-industry municipalities of the Russian Federation (single-industry towns)".

on the following principles: organization of the diversification process at three interrelated levels (corporation, division, enterprise); production of new products that correspond to promising areas of economic development; the use of integrator companies that organize the production of new products; the application of the open innovation principle. It is known that for enterprises with a significant stable state defense order, it becomes difficult to establish the production of civilian products [28]. The three-level diversification model helps to transfer a number of organizational issues to the level of the state corporation and divisions, which simplifies the process for the enterprise and at the same time allows using its resources for the development of new production facilities.

The model has proved its worth, the revenue from new civil activities of the Corporation (wind power, nuclear medicine, new materials, digital products, additive technology, control system and electrical engineering, nuclear icebreaker fleet, environmental solutions, etc.) is steadily increasing *(Fig. 1a)*, including, in comparable prices *(Fig. 1b)*.

The new diversification model makes changes in the spatial location of production: branches and separate divisions of integrators are organized in the locations of large enterprises in the industry that have the necessary resources (for example, divisions and branches of RASU LLC, JSC FCS&HT "SNPO "Eleron" in Ozersk, Sarov, Zheleznogorsk, etc.), including in the territories of advanced socio-economic development (Research and Production Association "Centrotekh", LLC "Ekoal'yans" in Novouralsk). The creation of new production facilities complemented a number of measures previously implemented by the state corporation for the development of the territories of presence: additional cities' financing by allocating part of the tax revenues of enterprises for this purpose (within the framework of agreements between the State Corporation Rosatom and the regions of presence, in particular the Chelyabinsk, Tver,

Figure 1. Total revenue and revenue for new products of the State Corporation Rosatom, billion rubles

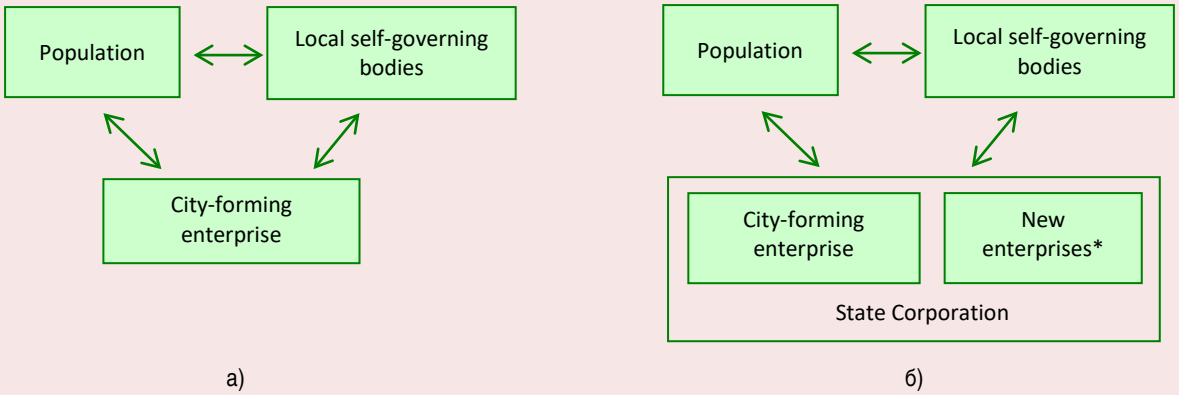


a) at current prices

b) in 2010 prices (using the index of industrial production)

Compiled by: public reports of the State Corporation Rosatom for the relevant years. Available at: https://rosatom.ru/about/publichnaya-otchetnost/; Industrial production indices / Rosstat. Available at: gks.ru/bgd/free/b00_24/isswww.exe/stg/d000/i000850r.htm (accessed April 25, 2021).

Figure 2. The municipal part of the social contract in single-industry towns with the presence of State Corporation Rosatom: a) with the participation of the city-forming enterprise; b) with the participation of the State Corporation



* New enterprises – enterprises created in the process of diversification of the activities of the State Corporation Rosatom.
Source: own compilation.

Smolensk oblasts, etc.)[9]; certain activities in the field of culture, education, digital development, etc.; participation in public and political life, etc.

Summarizing the actions of the State Corporation, we can talk about changing the municipal part of the social contract in single-industry towns, where the nuclear industry enterprises are the main ones. The Corporation replaces the city-forming enterprise and assumes an obligation (expectations of the population and local authorities) – the creation of a skilled, highly paid jobs *(Fig. 2)*.

The social contract refers to informal institutions that are used to change slowly. In this case, a number of formal institutional actions (state corporations, federal subjects, local self-government bodies) that correspond to the expectations and motivations of each of the parties led to changes in the informal institution. As a result, each party receives benefits:

– State Corporation – new production facilities, which contributes to the achievement of its three goals: increasing the sustainability of the main enterprises of the industry, the production of civilian products and the development of the territories of presence;

– city (local self-government bodies) – highly paid jobs, which increases the authority of the local government, the possibility of extending its powers;

– employees of enterprises – the opportunity to work in accordance with their qualifications, good salary, career opportunities;

– the rest of the population – expectations for the new jobs, an increase in the money supply in the city, the development of trade, services, etc.

Let us consider the reasons that contribute to the social contract changing and its support by all parties. Observations show that the CATE's population depends on the state of affairs at the city-forming enterprise. Thus, in the cities where the number of personnel of the city-forming enterprise was reduced as part of the restructuring of production carried out by the State Corporation Rosatom (Seversk, Novouralsk, Zelenogorsk), there

[9] Public report of the State Corporation Rosatom for 2016. URL: https://rosatom.ru/about/publichnaya-otchetnost/ (accessed December 25 2020)

Table 1. Change in the population of the cities of Seversk, Novouralsk, Zelenogorsk and city-forming enterprises, 2009-2017, thousand people

	Seversk		Novouralsk		Zelenogorsk	
	JSC "Siberian Chemical Plant"	City	JSC "Ural Electrochemical Plant"	City	JSC "Electrochemical Plant"	City
2009	12.7	113.8	12.1	107.5	9.5	68.5
2019	3.3	106.5	2.1	80.4	1.9	61.6

Compiled by: [29]; Regions of Russia. Main socio-economic indicators of cities / Federal State Statistics Service. Available at: https://rosstat.gov.ru/folder/210/document/13206; Annual report of JSC "Siberian Chemical Plant". Available at: http://atomsib.ru/files/2019/annual_report_SHK_2018.pdf; Annual report of JSC "Ural Electrochemical Plant". Available at: https://www.e-disclosure.ru/portal/files.aspx?id=17109&type=3&attempt=1; Annual report of JSC "Electrochemical Plant". Available at: https://www.e-disclosure.ru/portal/files.aspx?id=17608&type=3 (accessed May 12, 2021).

Table 2. Indicators of socio-economic development of CATE and the cities of the respective regions

Region / city	Population change, 2004–2020, %	Budget security, thousand rubles/person, 2019	Average salary for large and medium-sized enterprises, thousand rubles, 2019
Nizhny Novgorod Oblast			***35.2***
Sarov CATE	*+9.1*	*36.7*	*61.6*
Nizhny Novgorod	-2.0	23.6	49.7
Dzerzhinsk	-11.2	24.1	
Arzamas	-4.0	28.6	
Penza Oblast			***30.7***
Zarechnyi CATE	*+4.6*	*35.0*	*36.4*
Penza	+1.0	27.5	36.9
Kuznetsk	-12.6	20.3	
Chelyabinsk Oblast			***37.4***
Snezhinsk CATE	*+2.4*	*49.5*	*45.8*
Ozersk CATE	*-14.4*	*43.0*	*47.5*
Trekhgornyi CATE	*-5.2*	*44.1*	*44.3*
Chelyabinsk	+11.7	38.0	43.7
Zlatoust	-14.9	30.0	
Troitsk	-12.5	31.0	
Sverdlovsk Oblast			***41.1***
Novouralsk CATE	*-15.5*	*59.6*	*44.7*
Lesnoy CATE	*-7.5*	*49.5*	*39.2*
Yekaterinburg	+14.4	32.2	54.8
Pervouralsk	-8.1	31.0	
Kamensk-Uralskyi	-9.1	39.6	
Krasnoyarsk Krai			***49.9***
Zheleznogorsk CATE	*-11.9*	*40.6*	*53.1*
Zelenogorsk CATE	*-11.2*	*41.9*	*42.4*
Krasnoyarsk	+19.8	31.46	54.6
Achinsk	-9.7	30.7	
Kansk	-13.0	29.0	
Tomsk Oblast			***45.5***
Seversk CATE	*-11.0*	*40.1*	*47.1*
Tomsk	+22.4	30.8	51.8

Compiled by: Regions of Russia. Main socio-economic indicators of cities. FSGS. Available at: https://rosstat.gov.ru/folder/210/document/13206; Average monthly nominal accrued wages of employees for the full range of organizations in the economy as a whole for the subjects of the Russian Federation since 2018. FSGS. Available at: https://rosstat.gov.ru/labor_market_employment_salaries; Consolidated reports of the regions on the results of monitoring the effectiveness of the activities of the local self-government bodies at the end of 2019 (websites of the governments of the subjects of the Federation); Indicators for assessing the effectiveness of the activities of local self-government bodies of urban districts for 2019, reports of heads of administrations for 2019, reports on the implementation of budgets for 2019 (sites of city administrations: https://adm-sarov.ru, http://www.snzadm.ru, http://www.ozerskadm.ru, http://adm-ngo.ru, http://www.gorodlesnoy.ru, http://www.zarechny.zato.ru, http://admintrg.ru, https://xn----7sbhlbh0a1awgee.xn--p1ai, http://www.admk26.ru, https://www.zeladmin.ru, https://penza-gorod.ru, https://xn--80aaa0a0avl.xn--p1ai, https://vr-vyksa.ru, http://dzadm.ru, https://admgor.nnov.ru, https://cheladmin.ru, https://xn--80acgfbsl1azdqr.xn--p1ai, http://www.admkrsk.ru, https://admin.tomsk.ru) (accessed January 05, 2021).

was a corresponding decrease in the population *(Table 1)*. In general, in 2004–2020, the population of these cities decreased by 11–15% *(Table 2)*. Enterprises no longer correspond to the status of city-forming enterprises on formal grounds (in Seversk, Rosatom employs 5.7% of the population employed in the city's economy, in Zelenogorsk – 8%, in Novouralsk – 10.4%)[10].

In the entities locating the enterprises of the nuclear weapons complex, the situation is fundamentally different. The number of employees of these enterprises either did not change, or slightly increased, accounting for 32–50%[11] of the total number of employees in the city's economy. The population of such cities from 2004 to 2020 either increased (Sarov, Zarechnyi, Snezhinsk), or slightly decreased (Trekhgornyi, Lesnoy).

Migration processes are crucial, since almost all countries have experienced a natural population decline over the past 15 years. Single-industry towns are left by specialists of working age and school graduates after receiving higher education at universities in large cities, and are replenished mainly by residents of the nearby rural areas[12]. The decline in the number of jobs at the city-forming enterprises has led to a new trend for CATE – a noticeable pendulum migration to cities located relatively close to regional centers: up to 7–8 thousand people leave Novouralsk daily for work in Yekaterinburg and Nizhny Tagil[13]; about 18 thousand leave Seversk[14]; 6–8 thousand leave Zarechnyi[15]. At the same time, several thousand people of low-skilled labor enter CATE every day[16].

The dynamics of changes in CATE population as a whole corresponds to the trends inherent in other cities of the regions where they are located. The exceptions are Sarov and Zarechnyi, where the population growth rate is even higher than in the regional centers (see Table 2).

The average salary in most cities is higher than the average for the region of location. In CATE, the city-forming enterprises of which belong to the defense industry (Sarov, Snezhinsk, Ozersk, Trekhgorny, etc.), the average salaries are higher or comparable to the level of the corresponding regional centers.

The basis of CATE economy, however, is the city-forming enterprises, which (including those that have been restructured) have been operating steadily in recent years. Small businesses in most regions are developing more slowly compared to the region where they are located and are not a development resource for the city (*Table 3*). This situation has persisted steadily since the 1990s. We considered its causes earlier [30].

[10] Strategy of socio-economic development of the Novouralsky City District until 2030. Available at: http://duma-ngo.ru/strategia-ngo-2030; Annual report of JSC "Siberian Chemical Plant" for 2018. Available at: http://atomsib.ru/files/2019/annual_report_SHK_2018.pdf; Explanatory note to the annual accounting report of JSC "Electrochemical Plant" for 2018. Available at: http://www.ecp.ru/about/info; Indicators for evaluating the performance of local self-government bodies in Seversk, Novouralsk, and Zelenogorsk for 2019 (accessed January 11, 2021).

[11] Strategies for socio-economic development until 2035: of Sarov. Available at: https://adm-sarov.ru/city/economy/strategicheskoe-planirovanie/strategiya-sotsialno-ekonomicheskogo-razvitiya-/; of Zarechnyi Available at: http://www.zarechny.zato.ru/otrasli/strategiceskoe-razvitie-goroda/strategia-2035; of Snezhinsk. Available at: http://www.snzadm.ru/?art=22505; of Trekhgornyi. Available at: http://admintrg.ru/strategia-2035.html; Lesnoy. Available at: http://www.gorodlesnoy.ru/city/economica/strategiya-2035/ (accessed January 09, 2021).

[12] Strategies for CATE development until 2035, reports of heads of CATE administration.

[13] By the end of the year, there should already be 11 residents in Novouralsk. MK.ru Yekaterinburg. 21.02.2020. Available at: https://eburg.mk.ru/economics/2020/02/21/do-konca-goda-na-toser-novouralska-dolzhny-byt-uzhe-11-rezidentov.html (accessed December 26, 2020).

[14] We talk in CATE. The first online publication of Seversk CATE. 11.11.20. Available at: https://zato-govorim.ru/37029-2/ (accessed December 26, 2020).

[15] They make rockets in CATE. How the secret city of Zarechnyi lives. Argumenty i fakty. 27.01.2020. Available at: https://aif.ru/society/people/zato_tam_delayut_rakety_kak_zhivyot_zasekrechennyy_gorod_zarechnyy (accessed December 26, 2020).

[16] The main thing in Sarov is nuclear weapons and national security, the rest is secondary. Kommersant-Privolzhye-Online. 02.10.2020. Available at: https://www.kommersant.ru/doc/4512943 (accessed December 26, 2020).

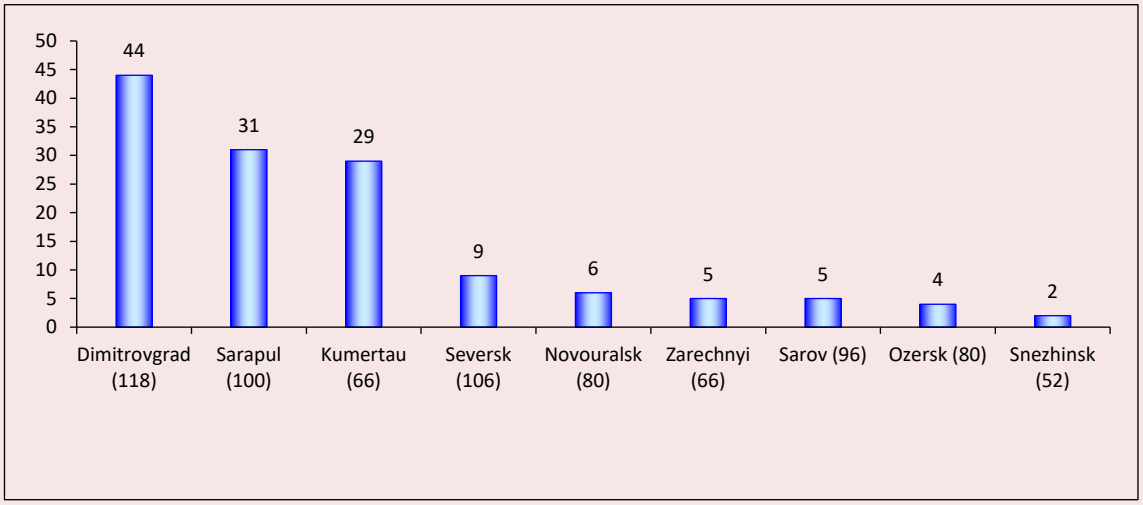
Table 3. The share of employees in small and medium-sized enterprises, 2015–2019, % of the average number of employees of all enterprises and organizations

Region / city	2015	2016	2017	2018	2019
Nizhny Novgorod Oblast	***no data***	***no data***	***no data***	***no data***	***33.3***
Sarov CATE	*22.8*	*22.3*	*19.1*	*13.9*	*17.6*
Dzerzhinsk*	45.3	44.7	45.2	38.6	38.6
Arzamas*	19.1	17.9	18.4	18.0	16.7
Penza Oblast	***44.,1***	***no data***	***no data***	***21.17***	***27.14***
Zarechnyi CATE	*13.6*	*15.2*	*20.5*	*20.9*	*21.5*
Chelyabinsk Oblast	***no data***	***no data***	***25.5***	***25***	***24.5***
Ozersk CATE	*14.7*	*14.8*	*21.5*	*21.5*	*21.3*
Trekhgornyi CATE	*no data*	*24.1*	*26.0*	*30.4*	*16.5*
Sverdlovsk Oblast	***31.3***	***no data***	***no data***	***31.2***	***31.5***
Novouralsk CATE	*25.6*	*25.6*	*25.5*	*25.4*	*25.3*
Lesnoy CATE	*21.4*	*21.4*	*21.5*	*21.8*	*21.6*
Krasnoyarsk Krai	***31.3***	***30.6***	***22.0***	***32.5***	***31.1***
Zheleznogorsk CATE	*33.2*	*33.8*	*21.6*	*20.6*	*20.1*
Zelenogorsk CATE	*27.1*	*28.3*	*25.7*	*25.6*	*25.4*
Tomsk Oblast	***37.5***	***26.0***	***28.9***	***27.1***	***no data***
Seversk CATE	*41.2*	*42.1*	*42.3*	*42.4*	*43.3*

* Data for comparable cities are provided due to the lack of data for the region as a whole.

Compiled by: Summary reports of the regions on the results of monitoring the effectiveness of the activities of the local self-government bodies for the corresponding years (websites of the governments of the subjects of the Federation); Indicators for evaluating the effectiveness of the local government bodies of urban districts for the relevant years (sites of city administrations: https://adm-sarov.ru, http://www.ozerskadm.ru, http://adm-ngo.ru, http://www.gorodlesnoy.ru, http://www.zarechny.zato.ru, http://admintrg.ru, https://xn----7sbhlbh0a1awgee.xn--p1ai, http://www.admk26.ru, https://www.zeladmin.ru, https://xn--80aaa0a0avl.xn--p1ai, https://vr-vyksa.ru, http://dzadm.ru, https://xn--80acgfbsl1azdqr.xn--p1ai) (accessed May 10, 2021).

Figure 3. The number of residents in TASED CATE and similar cities in terms of population and specialization, November 2020, units



The population of cities, thousand people, is shown in parentheses.

Compiled by: Register of residents of Territories of advanced Socio-economic Development in the territories of Single-industry Municipalities of the Russian Federation (single-industry towns). Available at: https://www.economy.gov.ru/material/directions/regionalnoe_razvitie/instrumenty_razvitiya_territoriy/tor/; Register of TASED residents in CATE of the nuclear industry. Available at: https://atomtor.ru/reestr/ (accessed December 21, 2020).

The creation of territories of advanced socio-economic development (TASED) in the Russian Federation has not yet led to a significant development of small and medium-sized businesses. The number of residents there as of November 2020 was insignificant and roughly corresponded to the average values in other TASED regions of the location (from 2 to 9 residents), which is significantly different from the indicators of some TASED in similar cities in terms of population and specialization (nuclear industry, defense industry): Dimitrovgrad, Sarapul, Kumertau, etc. *(Figure 3)*.

Budget security in CATE is higher than in other cities in the regions of location (see Table 2). Additional budget transfers are due to the CATE status. In general, the increased budget security has been maintained for the last 15 years [31, p. 153, 214]. Additional budget revenues help local authorities to fulfill their current obligations, but they cannot provide solutions to complex tasks of infrastructure modernization, breakthrough development, etc. [25].

Discussion

The considered processes allow us to make a number of generalizations. The socio-economic situation in the city depends fundamentally on the city-forming enterprise. The reduction in the number of its staff leads to a decrease in the city's population and average city salaries (respectively, the purchasing power of the population as a whole, which does not contribute to business development), an increase in pendulum migration. Thus, the attractiveness of the city for work and life is reduced. Small businesses in CATE are developing slowly. Low-skilled jobs are not attractive for CATE residents.

We may assume that in the future, in the event of job cuts or other negative changes, the skilled labor force will look for jobs in other cities. At the same time, the city-forming enterprises that are of strategic importance and, based on forecasts, are still in demand in the long term[17], need both the current replenishment of the labor force and the possible expansion of production volumes (taking into account the dependence of the activities of these enterprises on politics). In such conditions, they must have a reserve of qualified labor and well-established ways to attract it (at least, university graduates having necessary specialties and qualifications).

One of the opportunities for the formation of such a reserve may be the creation of enterprises in CATE that are close to the technological level of the city-forming ones. Practice has shown that private business does not create such enterprises in Russia. A possible way is to initiate this process by the state corporation Rosatom, which, on the one hand, is actively working to diversify its activities, on the other hand, has significant experience in CATE and obligations to support the territories. New companies can be created by both integrators and city-forming enterprises by allocating separate civil areas. In this case, we are not talking about restructuring, that is, the withdrawal of service activities (transport, catering, repairs, etc.) into separate legal entities, but rather about the allocation of high-tech civilian production facilities.

From a theoretical point of view, such a process leads to changes in the municipal part of the social contract, forming an appropriate balance of benefits and costs for its parties.

Employment in high-tech enterprises located in the general management of Rosatom is more attractive than in private business for the population

[17] Despite the different points of view, experts in the next few decades do not see a replacement for nuclear energy: the global economic situation and prospects for 2020. United Nations, New York, 2020. Address: https://www.un.org/development/desa/publications/wesp-2020.html (accessed 12.20), and nuclear weapons: Russian Federation National Security Strategy, approved by Presidential Decree No. 683 dated December 31, 2015.

(employees of enterprises and job applicants). In exchange for this benefit, the population offers skilled labor, loyalty to the state corporation (and to the state in its person), including political stability and predictability.

For city-forming enterprises, especially defense enterprises, the process of creating civil production facilities by the state corporation allows not to be distracted by the formation of a parallel management system. It is no secret that the management system within the framework of the State Defense System and the market differs markedly, while the heads of defense enterprises are not always interested in replacing the state defense order with civilian products [23].

For local governments, however, the formation of new enterprises is important, since it is extremely difficult to attract business to the territory. In this aspect, it is easier to create a new business in CATE for the state corporation Rosatom than in the city and even in the region: local governments most often do not have the funds for this, interested and experienced production organizers, ways to motivate investors; the region is likely to prioritize less developed municipalities than CATE. The state corporation can attract not only investments, but also the necessary specialists and technologies. Interaction with large customers and suppliers is easier for it.

The expansion of production increases the problem of attracting and retaining personnel. High-tech industries require highly qualified specialists and graduates of leading universities, for which CATE are competing with the largest megacities. In order for the work in CATE to be interesting for specialists, it is necessary not only to have an appropriate level of salary, but also to have comfortable living conditions. A small city is significantly inferior to large agglomerations in terms of the quality and quantity of social services, leisure attractiveness, etc. CATEs have a number of formal restrictions in addition to this. In order to offset such differences to some extent, it is necessary to purposefully develop strengths, in particular, to build comfortable housing that is affordable for a specialist (the city-forming enterprise and the city can help here); to ensure safety (which is easier to do in case of CATE); to improve the city territory, focusing on natural recreation; to ensure a high level of education for children; to develop medicine, etc. Foreign studies confirm the conclusions about the need for a favorable quality of life to attract scientists and specialists in high-tech industries [32; 33].

Creating comfortable living conditions within the framework of the social contract is the responsibility of the MHI. However, it is almost impossible for them to create conditions that could compete with megacities independently. The state corporation can also help with this. First, it provides lobbying support at the level of the country's top leadership and federal executive bodies. It is clear that the key condition on the part of the MHI will be the full loyalty of the state corporation. The issue of creating comfortable living conditions is included not only in the municipal, but also in the regional part of the social contract, which implies the inclusion of a state corporation in it.

Conclusion

The justification of the three-level model of the social contract, the allocation of its features at the municipal level for single-industry towns determined the scientific novelty of the research and its contribution to the general theory of the social contract.

A joint study of the issues of diversification in the nuclear industry and the development of the territories of presence allowed us to conclude that the proposed model of the social contract is adaptable to changing conditions. In particular, replacing the city-forming enterprise in the municipal part of the contract with the state corporation, which it is a part of, does not distort the essence of the social contract, but expands opportunities for the development of the territory of presence by creating new jobs, increasing revenues to the local budget, developing urban

infrastructure, etc., generally increasing the comfort of life. Such changes, considered in the context of the nuclear industry, are due to the introduction of a new diversification model where the creation of new civilian products is organized in the territories of presence. The new version of the social contract seems to be promising taking into account the planned dynamics of the production of new products by Rosatom[18]. The presented model confirms its viability and relevance in practice, and may be of interest to single-industry towns, city-forming enterprises and holdings of other industries[19]. The basic principles of the study have been tested in the nuclear industry and can be used to develop strategic documents for spatial development, programs for the development of single-industry towns, city-forming enterprises and holdings.

References

1. Lynn III W. The end of the military-industrial complex. How the Pentagon is adapting to globalization. *Foreign Affairs,* 2014, no. 93, pp. 104–110.
2. Matelly S., Lima M. The influence of the state on the strategic choices of defense companies: The cases of Germany, France and the UK after the Cold War. *Journal of Innovation Economics & Management,* 2016, vol. 2, no. 20, pp. 61–88.
3. Scherbakova L.I. Institute of local self-government in transforming Russian society. *Sotsial'no-gumanitarnye znaniya=Socio-Humanitarian Knowledge*, 2012, no. 7, pp. 374–380 (in Russian).
4. Surtseva A.A. Regional social contract practice between business and authorities (case study of the Kemerovo Oblast). *Zhurnal institutsional'nykh issledovanii=Journal of Institutional Studies*, 2011, vol. 3, no. 3, pp. 94–102 (in Russian).
5. Shafik N. A new social contract. *Finance & Development*, 2018, vol. 0055, iss. 004. DOI: https://doi.org/10.5089/9781484386194.022
6. Snyder M., Gupta A. The social contract for AI. *Computers and Society,* 2020. Available at: https://arxiv.org/abs/2006.08140 (accessed: May 11, 2021).
7. Auzan A.A. On the possibility of transition to an economic strategy based on the specifics of human capital in Russia. *Zhurnal Novoi ekonomicheskoi assotsiatsii=The Journal of the New Economic Association*, 2015, no. 2, pp. 243–248 (in Russian).
8. Ivanova M.V. Tendencies and features of development of Russian monotowns and their competitive recovery. *Vestnik Kemerovskogo gosudarstvennogo universiteta. Seriya: Politicheskie, sotsiologicheskie i ekonomicheskie nauki=Bulletin of Kemerovo State University. Series: Political, Sociological and Economic Sciences*, 2018, no. 1, pp. 86–91. DOI: 10.21603/2500-3372-2018-1-86-91 (in Russian).
9. Proskurnin S.D. Basic premises and trends CATF GK «Rosatom». *Regional'naya ekonomika i upravlenie: elektronnyi nauchnyi zhurnal=Regional Economics and Management: Electronic Scientific Journal*, 2019, no. 1 (57), pp. 1–27 (in Russian).
10. Animitsa E.G., Kuznetsov V.N., Ergunova O.T. Creation of the territories of the advancing social and economic development in borders of the closed administrative territorial formations of Sverdlovsk region. *Uspekhi sovremennoi nauki i obrazovaniya=Advances in Modern Science and Education*, 2016, no. 12, vol. 4, pp. 92–95 (in Russian).

[18] The strategic goal is to generate 1.6 trillion rubles in revenue from new products in 2030. Report of the State Corporation Rosatom. 2019. Available at: https://rosatom.ru/about/publichnaya-otchetnost/ (accessed January 25, 2021).

[19] A similar approach can be noted, for example, in the comprehensive application of the Kemerovo Research Center to the KNP, which includes the creation of modern production facilities for deep processing of coal and coal chemistry (as a diversification of coal mining). This is a typical example, since most cities in the Kemerovo Region are monospecialized. Available at: https://ako.ru/news/detail/zayavku-na-razrabotku-kompleksnoy-nauchno-tekhnicheskoy-programmy-polnogo-innovatsionnogo-tsikla-nots (accessed January 18, 2021).

11. Peshina E.V., Animitsa E.G., Bochko V.S., Animitsa P.E. *Kontseptual'nye podkhody k razrabotke strategii razvitiya monoprofil'nogo goroda* [Conceptual Approaches to Developing a Strategy for the Development of a Single-Industry City]. Ed. by A.I. Tatarkin, M.V. Fedorov. Yekaterinburg: Izd-vo UrGEU, 2010. 81 p.
12. Shastitko A.E., Fatikhova A.F. Company towns in Russia: Some thoughts on development alternatives. *Gosudarstvennoe upravlenie. Elektronnyi vestnik=E-journal. Public Administration*, 2019, no. 76, pp. 109–135. DOI: 10.24411/2070-1381-2019-10006 (in Russian).
13. Bukhvald E.M. Mono-company towns within the strategic planning system in Russia. *Teoriya i praktika obshchestvennogo razvitiya=Theory and Practice of Social Development*, 2017, no. 12, pp. 75–78. DOI: https://doi.org/10.24158/tipor.2017.12.16 (in Russian).
14. Vakhtina M.A., Ignatova T.V. Institutional limitations on the way of complex development of Russian single-industry towns. *Vestnik Akademii znanii=Bulletin of the Academy of Knowledge*, 2020, no. 36 (1), pp. 43–47. DOI: 10.24411/2304-6139-2020-00008 (in Russian).
15. *Razvitie monogorodov Rossii: monografiya* [Russian Monotowns Development: Monograph]. Team of authors. Ed. by Doctor of Sciences (Economics), Professor I.N. Il'ina. Moscow: Financial University, 2013. 168 p.
16. Kolesnik E.A. Threats and risks of diversification of economy of mono-industrial towns. *Vestnik Chelyabinskogo gosudarstvennogo universiteta=Bulletin of Chelyabinsk State University*, 2018, no. 3 (413), economic sciences, iss. 60, pp. 47–52 (in Russian).
17. O'Hagan S., Cecil B. A macro-level approach to examining Canada's primary industry towns in a knowledge economy. *Journal of Rural and Community Development,* 2007, no. 2, pp. 18–43. Available at: https://journals.brandonu.ca/jrcd/article/view/84/31
18. Bole D., Kozina J., Tiran J. The variety of industrial towns in Slovenia: A typology of their economic performance. *Bulletin of Geography. Socio-Economic Series,* 2019, vol. 46, iss. 46, pp. 71–83. DOI:10.2478/bog-2019-0035
19. Trapeznikova I.S. The modern model of Russian business social responsibility in the context of skilled labor force formation at the territory of presence. *Ekonomika truda=Russian Journal of Labour Economics*, 2019, vol. 6, no. 2, pp. 689–698. DOI: 10.18334/et.6.2.39794 (in Russian).
20. Lazarenko V.A. Corporate social responsibility of large business in Russia. *Vestnik Moskovskogo Universiteta. Seria 5, Geografia=Moscow University Bulletin. Series 5, Geography*, 2018, no. 1, pp. 66–72 (in Russian).
21. Korzhevskaya A.A. Interaction between authorities and corporate structures is one of the models of innovative regional development. In: *Ural – XXI vek: region innovatsionnogo razvitiya: materialy II Mezhdunar. nauchno-praktich. konf.* [Ural – *XXI* century: A region of innovative development: Proceedings of the 2nd international research-to-practice conference]. Yekaterinburg: Izd-vo UrGEU, 2017. Pp. 119–122 (in Russian).
22. Zemtsov S.P., Chernov A.V. What high-tech companies in Russia grow faster and why? *Zhurnal Novoi ekonomicheskoi assotsiatsii=The Journal of the New Economic Association*, 2019, no. 1 (41), pp. 68–99. DOI: 10.31737/2221-2264-2019-41-1-3 (in Russian).
23. Kuznetsov N.V., Kotova N.E. Using the institute of public corporations for ensure economic growth. *Fundamental'nye issledovaniya=Fundamental Research*, 2020, no. 8, pp. 40–44 (in Russian).
24. Mailyan S.S. On some aspects of the economic nature of state-owned corporations. *Vestnik ekonomicheskoi bezopasnosti=Vestnik of Economic Security*, 2019, no. 4, pp. 314–317. DOI: 10.24411/2414-3995-2019-10264 (in Russian).
25. Çağlar K., Bitzinger R. Defense industries in the 21st century: A comparative analysis – The second e-workshop. *Comparative Strategy*, 2018, vol. 37, iss., 4, pp. 255–259. DOI: 10.1080/01495933.2018.1497318
26. Ivanter V.V., Semikashev V.V. Nuclear industry role in national economy and challenges it faces. *Energeticheskaya politika=The Energy Policy*, 2017, no. 3, pp. 3–11 (in Russian).
27. Faikov D.Yu., Baydarov D.Yu. Diversification of production in the nuclear industry. *Ekonomicheskoe vozrozhdenie Rossii=The Economic Revival of Russia*, 2020, no. 3, pp. 96–109. DOI: 10.37930/1990-9780-2020-3-65-96-109 (in Russian).

28. Rozmirovich S.D., Manchenko E.V., Mekhanik A.G., Liss A.V. *Diversifikatsiya OPK: kak pobezhdat' na grazhdanskikh rynkakh: doklad Ekspertnogo soveta Predsedatelya kollegii Voenno-promyshlennoi komissii RF dlya V Mezhdunar. Foruma tekhnol. razvitiya «Tekhnoprom»* [Diversification of the defense industry: How to win in civilian markets: Report of the Chairman of the Expert Council of the Collegium of the Military-Industrial Commission of the Russian Federation]. Novosibirsk, 2017. Available at: http://www.instrategy.ru/pdf/367.pdf (accessed: December 21, 2020).
29. Chernyatin D.M., Belyakova G.Ya. Peculiarities of restructuring of non-core departments of enterprises of the ZATO of the state-corporation "Rosatom". *Sovremennaya nauka: aktual'nye problemy teorii i praktiki. Seriya: Ekonomika i pravo=Modern Science: Actual Problems of Theory and Practice. Series Economics and Law*, 2019, no. 1, pp. 46–53 (in Russian).
30. Faikov D.Yu., Baydarov D.Yu. New trends in the development of closed administrative-territorial entities (for example, the nuclear industry CATF). *Kontury global'nyh transformacij: politika, ekonomika, pravo=Outlines of global transformations: politics, economics, law*, 2014, no. 6, pp. 120–131 (in Russian).
31. Faikov D.Yu. *Zakrytye administrativno-territorial'nye obrazovaniya. Sistemnye transformatsii* [Closed Administrative-Territorial Entities. System Transformations]. Sarov: FGUP «RFYaTs-VNIIEF», 2012. 394 p. Available at: http://book.sarov.ru/product/zato/ (accessed: November 20, 2020).
32. Salvesen D., Renski H. *The Importance of Quality of Life in the Location Decisions of New Economy Firms.* Report 99–07–13815. Chapel Hill: Center for Urban and Regional Studies, 2003. Available at: https://www.researchgate.net/profile/David-Salvesen/publication/228494438_The_importance_of_quality_of_life_in_the_location_decisions_of_new_economy_firms/links/55ad37d408aed9b7dcdad66d/The-importance-of-quality-of-life-in-the-location-decisions-of-new-economy-firms.pdf
33. Bajpai N., Prasad A., Pandey P. Work life balance retention (WLBR) model – a weapon to retain hi-tech employees. *International Journal of Management Sciences and Business Research,* 2013, vol. 2, iss. 12, pp. 92–102. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2715356

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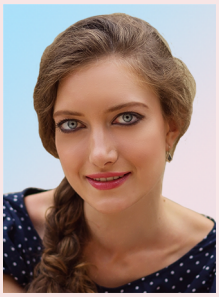
Metallurgical Corporations and the State: Trends in Financial Interaction of the Last Decade*



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Abstract. The dominant role of big business in the formation of Russia's GDP determines its high importance both for the country's economy as a whole and for the economies of individual regions. In this regard, studies that address the issues of assessing the financial interaction of large corporations with the state are relevant and necessary. Interaction of these economic agents with each other is complex and contradictory, as in modern market conditions the interests of the state and economic entities are multidirectional. The Vologda Research Center of RAS pays attention to studying the influence of large corporations on regional development, in particular on the formation of budget revenues. As a result of the long-term research, we have formed a serious factual base that allows understanding

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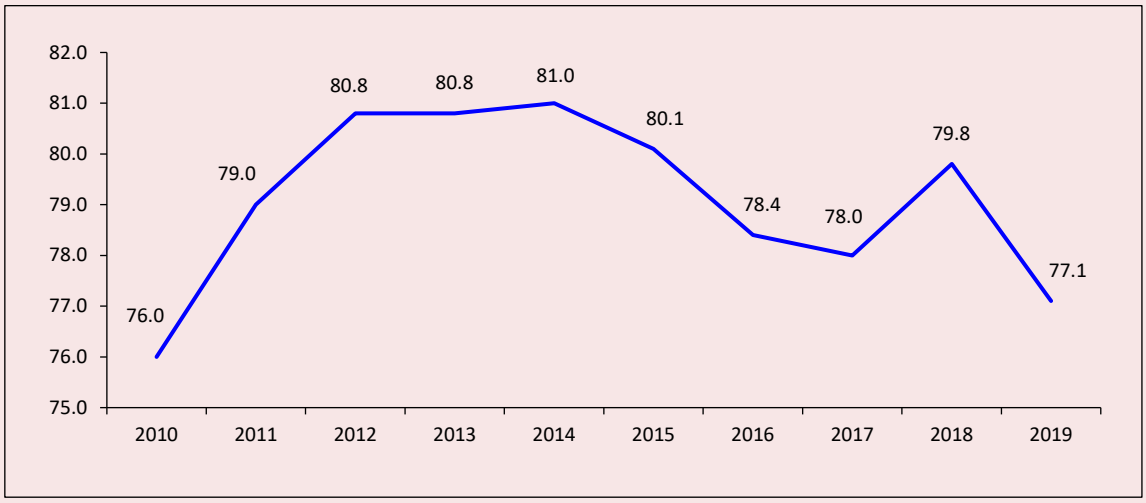
the main interaction features of large businesses with the regional and federal budgets, to determine systemic shortcomings of the state's tax policy including those related to the taxation of profits and income of corporate owners. However, currently, there is no single mechanism in the scientific literature that can be used to most comprehensively assess the financial interaction of large businesses with the region. At the same time, the results of such an assessment can become a serious foundation for justifying many management decisions. The purpose of the study is to assess the trends of financial interaction between the state and corporations on the basis of the developed methodological tools. The authors have tested the methodology in the case of ferrous metallurgy industry. The object of the study is the financial interaction of large ferrous metallurgy corporations (PJSC "Severstal", PJSC "MMK" and PJSC "NLMK") with the state. The paper uses the methods of structural (weight) analysis, coefficient analysis linking the microeconomic indicators of enterprises with the macroeconomic indicators of the home regions, the index method, and the method of level estimation when creating the methodological assessment tools.

Key words: interaction assessment, regional economy, budget system, taxation of large corporations, ferrous metallurgy, assessment methods and tools.

Introduction to the problem

Large corporations are rather important for Russian economy. This is evidenced by the growing share of large businesses in the country's GDP since 2010 according to Rosstat. For instance, as of 2019, the share of large businesses in Russia's GDP was 77.1% which is 1.1 p.p. more than in 2010, and its average value for 10 years is slightly less than 80%[1] *(Fig. 1)*.

Figure 1. Share of large business in Russia's GDP from 2010 to 2019, %



Source: UJSJS and Rosstat data.

[1] The share of large businesses in Russia's GDP was calculated by subtracting the share of small and medium-sized businesses from the total GDP. Source: For small and medium-sized enterprises in gross domestic product. Available at: https://www.fedstat.ru/indicator/59206

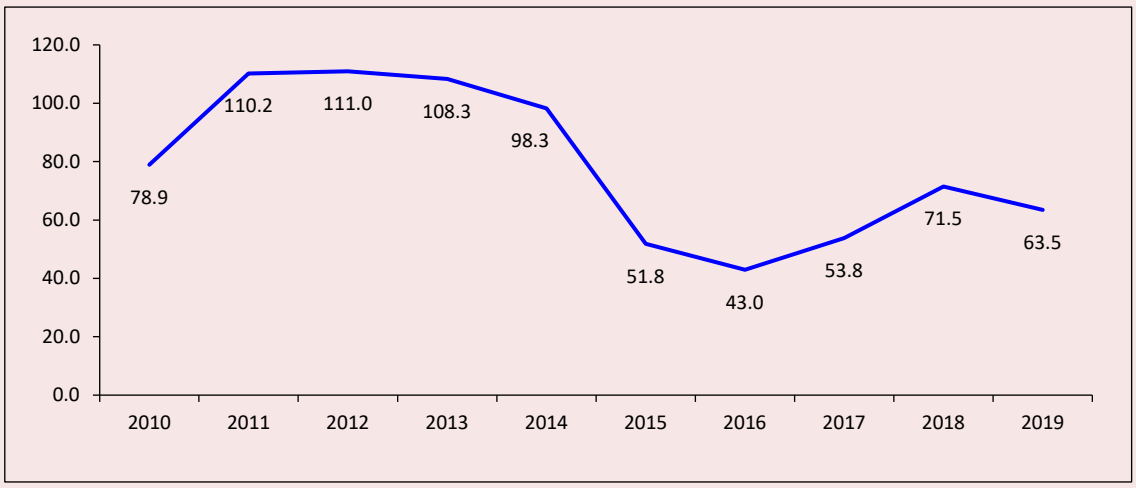
In Russia, this indicator is significantly higher than in the developed European countries. For instance, according to Eurostat[2], in Germany, Sweden, France, the United Kingdom, and the Netherlands, the share of large businesses for the same period varied from 32 to 45–50%.

Studying the role of big business is becoming particularly relevant in the current socio-economic situation which is associated with difficult conditions due to the relatively low world prices for hydrocarbons. For example, the price of oil was rather high in 2011–2014. (an average of $ 106.9 per barrel); it decreased more than halved over the next two years and by 2016 was approximately $ 43.0 per barrel *(Fig. 2)*.

In response to such market conditions, since 2014, the Central Bank of the Russian Federation has introduced the so-called "floating ruble exchange rate" which has increased the dependence of the exchange rate on events in foreign markets and geopolitical circumstances. In the context of high dollar exchange rate, large Russian corporations, which have an impressive share of sales in foreign markets, were able to increase their export revenues and influence on the formation of budget revenues.

The scientific works show high significance of studying the financial cooperation effectiveness between the state and large Russian corporations. N.A. Khilko and V.V. Karginova studied the problems and possibilities of implementing the so-called state-corporate economy in detail [1]. Regarding the impact of large business on sustainable territorial development, E.V. Dobrolezha pointed out that the potential of big companies largely forms the territorial potential [2]. The scientists of the Vologda Scientific Center of RAS V.A. Ilyin and A.I. Povarova devoted their scientific works to the research of this topic [3–6]. The authors have conducted a complex analysis of production and financial activities in the case of Russian and Brazilian metallurgical plants in order to assess their contribution to the formation of budget revenues in the home regions. The works of the Institute of

Figure 2. Average price* of Brent and Urals crude oil per barrel, US $



* The price of Brent crude oil is higher than Urals, on average by $ 1.4 for the study period

Source: site data global-finances.ru

[2] Statistical Service of the European Union. Available at: https://ec.europa.eu/eurostat/web/main/data/database

Economic Forecasting of RAS study the topic of effective management of the metallurgical industry in detail. For example, I.A. Budanov made an important conclusion based on the conducted research: "It is too early to expect that Russia will create a mechanism that is no less interesting for metallurgy than vertically integrated corporate governance. The formation of a mechanism for interstate and inter-corporate cooperation in the areas of activity related to metallurgy has not only certain prerequisites, but also quite serious limitations. In a rapidly changing economy, there is a need for flexible ways to meet demand at a qualitatively different level, and there is a need for voluntary cooperation mechanisms. The area of joint interests of market participants in the effective use of resources is much broader than the area of potential conflicts related to the need for individual companies to improve their efficiency as the requirements for cooperation participants grow" [7].

Thus, the problem is in the lack of methods that can be used to comprehensively assess the financial interaction of the state and corporations. On this basis, the purpose of the study is to assess the trends of financial interaction between the state and corporations on the basis of the developed methodological tools (for example, ferrous metallurgy corporations).

Based on this purpose, it is necessary to solve the following tasks:

– to analyze the domestic and foreign literature which presents an attempt to assess the financial interaction of enterprises with the state;

– to calculate a number of analytical coefficients that characterize the financial interaction of enterprises with the state, for the formation of budget, tax burden and management impact;

– to calculate indices and integral indeces using the coefficients;

– to evaluate the financial interaction of enterprises with the state on a level scale (for example, large corporations of ferrous metallurgy).

Theoretical basis of the research

To increase the efficiency of interaction between various economic agents, a set of organizational, legal, economic and other measures is necessary to facilitate this process. From this point of view, we should understand what efficiency level has been achieved at the moment. At the same time, in order to predict and plan future management decisions, it is necessary to monitor interaction assessment between economic agents. For instance, Yu.G. Tyurina believes that the assessment of tax revenues to budgets of different levels is essential to create an effective mechanism for the formation of tax potential and forecasting future revenues [8].

The analysis of foreign and domestic literature shows that the existing indicators, which in one way or another indicate the influence of large business on the development of the country and its regions, are concentrated around indicators of the tax burden, profit and various rates. For example, J. Creedy and N. Gemmell consider the asymmetry of corporate tax and effective tax rates [9]. J. Park and Y. Lee revealed growth pattern in corporate payables with an increase in corporate tax [10]. F. Reito and S. Spagano used indicators that characterize the advantages and disadvantages of taxation of joint activities of taxpayers [11]. A. Abdullahi assessed the impact of financial liberalization on the economic growth and development of some African countries. Econometric calculations showed that, on average, financial liberalization had a negative impact on income growth and led to destabilization stimulating domestic capital outflows and increasing the risk of financial instability. In the course of the study, the author applied an evaluation system called the "generalized method of moments" (GMM) which has shown its effectiveness in evaluating semi-parametric models where the parameter of interest is finite-dimensional [12]. A team of Dutch scientists evaluated the interaction between business and the e-Government system using the

case of the Netherlands. The results of this study helped to understand the existing differences in assessing the success of e-government projects in reducing the administrative burden on business [13]. I. Leibus focused on studying the dynamics and structure of tax payments in agriculture in Latvia to identify factors that contribute to an increase in the tax burden. As a result of the research, it is concluded that the tax burden in agriculture is growing due to production or the production cost, while the tax burden on capital has been decreasing in recent years [14]. The work of G. Giriiniene carried out a comparative analysis of the tax burden of the tax systems of different countries using the index method. The tax burden index is an important indicator for comparing the international efficiency of tax systems. The scientist also identified and characterized the methods of assessing the tax burden that are most often found in the literature [15]. A study by Lithuanian scientists from the Mikolas Romeris University examines the theoretical and practical aspects of interaction between public administration and business management. Based on the analysis, the authors propose a comprehensive model of interaction between public and private sectors consisting of five dimensions [16].

T.V. Maksimova carries out the systematization of methods for calculating tax burden of economic entities [17]. She examines their advantages and disadvantages drawing attention to a triad of key factors of the tax burden including accounting policies, types of activities of organization and tax regimes.

E.A. Kirova has identified two types of tax burden calculation: absolute and relative [18]. For example, absolute tax burden is calculated as the sum of tax payments paid by the organization, payments to extra-budgetary funds and arrears on payments. Relative tax burden is the ratio of the absolute tax burden to the newly created value. The researcher explains that the absolute tax burden does not reflect the full weight of the tax burden, but only shows the amount of the tax liabilities of the organization.

M.I. Litvin calculates the tax burden of an enterprise as the ratio of the amount of accrued tax payments and deductions to extra-budgetary funds to the amount of the source of funds intended for paying taxes. It is worth noting that this method has a high level of practical significance, as it is used to determine the share of taxes in the total amount of organization's revenue, profit and wages, depreciation, taxes and net profit in each ruble of the created products. The disadvantage of the method is the absence of personal income tax as a part of tax payments [19].

The assessment of the problem of regional policy development was carried out by well-known regional scientists. For example, O.S. Pchelintsev and M.M. Minchenko analyzed the state of modern infrastructure and its impact on the region's economy. The rapid depreciation growth of fixed assets in the housing and utilities sector, roads, and heating networks slows down economic development. The authors draw attention to the fact that private investment and business can be attracted to modernization of infrastructure facilities in exchange for reducing tax burden [20].

The series of works by V.A. Ilyin and A.I. Povarova actively use the analysis of specific weights of income tax indicators and their deviations from the norm as methods of scientific research. At the same time, an important component of the research was the calculation of the difference between the estimated income tax at the rate of 20% and actual income tax paid. In addition, the authors analyzed the indicators of dividend payments, management and commercial expenses and remuneration, as well as their ratio to the revenue and net profit of enterprises [21–24].

E.S. Andreeva has evaluated the effectiveness of public-private partnership projects. The author

notes that their implementation requires careful control over the effective use of funds. In this regard, the assessment of the overall economic efficiency of projects includes an increase in the domestic regional product, an increase in the budget and financial efficiency of the project. For the analysis of the projects, the article uses such indicators as net discounted income, the return on investment index, the internal rate of return on investment, and the discounted payback period [25].

From all of the above, we can conclude that the existing domestic and foreign works contain a significant number of indicators that can reflect the efficiency of financial cooperation between the state and large corporations. At the same time, methodological issues related to assessing the efficiency of such interaction remain an urgent scientific task.

Methodological provisions

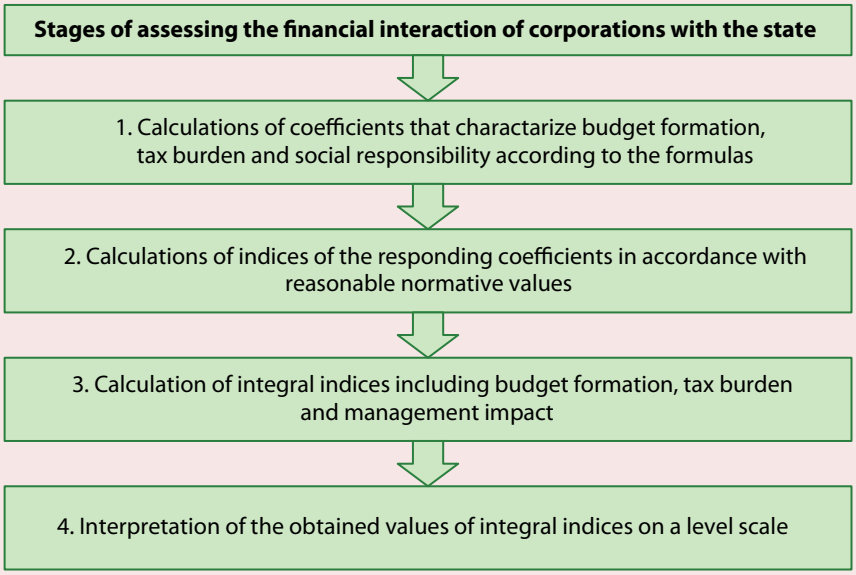
In the study, we propose to perform an assessment according to a certain algorithm. It is advisable to present its linear flowchart in the form of four consecutive stages *(Fig. 3)*.

At the *first stage*, it is necessary to calculate the coefficients the choice of which, in our opinion, should be determined by the possibility of using them to determine the role of corporations in the revenues of regional budgets, the "severity" of the fulfillment of tax obligations, as well as the degree of using the financial results of corporations in the interests of shareholders and managers.

In this regard, the above indicators can be used as the basis for methodological tools for assessing the effectiveness of financial cooperation between the state and large corporations. However, it is important to note that most of them characterize the tax burden of economic entities practically ignoring the process of forming budget revenues and social responsibility of business [26; 27].

At the same time, it is these questions that allow assessing the completeness and effectiveness of various areas of cooperation. Therefore, the paper proposes to distinguish three groups of coefficients that will characterize the tax burden of economic entities, their ability to form a budget, as well as the degree of managerial influence.

Figure 3. Stages of evaluating the effectiveness of financial cooperation between corporations and the state



Source: own compilations.

At the same time, the regulatory values of the coefficients should be established on the basis of key Russian regulatory and legislative acts[3] concerning the taxation of economic entities, and recommendations given in the scientific literature that affect the distribution and dividend policy of companies.

The system of evaluation coefficients taking into account these positions is presented in *Table 1*.

Table 1. System of coefficients for evaluating the financial interaction effectiveness between corporations and the state

№	Coefficient name	Calculation formula	Normative value	Description
Group 1: Budget formation coefficient				
1.	Coefficient of the company's tax potential $C_{t.p.}$	Company revenue / Tax revenue of the regional budget	2–10	It shows the ratio of the company's revenue to the tax revenue of the regional budget. A value greater than the norm indicates a high tax potential of the company in the formation of the budget. At the same time, a tenfold excess indicates a strong dependence of the region on the financial result of corporation.
2.	Coefficient of formation of the regional income tax $C_{f.i.t.}$	Company income tax / Total income tax receipts in the regional budget	0.2–0.5	It is defined as the ratio of income tax to total income tax receipts for the region. The increase in the regulatory value indicates a strong dependence of the regional budget on the activities of corporations.
3.	Coefficient of formation of budgetary income tax on profit $C_{f.b.i.}$	Company income tax / Regional budget revenues	0.05–0.2	It shows the share of income tax in the total budget revenues of the region. If the calculated value exceeds 0.05, then we can talk about the importance of the enterprise in the formation of regional budget revenues.
4.	Coefficient of formation of the regional property tax $C_{f.r.pr.t.}$	Company income tax / Tax property tax receipts in the regional budget	0.1–0.3	It shows the share of the company's property tax in the total property tax receipts for the region. The higher this indicator, the higher the value of the company's production assets.
5.	Coefficient of formation of PIT in the region $C_{f.pit.r.}$	Company PIT / Total PIT receipts in the budget	0.1–0.2	It shows the share of the company's PIT in the total income tax receipts for the region. An estimated value of more than 0.2 indicates a high level of wages at the company, as well as a large number of workers.
6.	Coefficient of the federal budget balance for VAT $C_{f.b.bal.vat}$	Company VAT / Income tax to the federal budget	0–100	It shows the ratio of the value added tax to the corporate income tax transferred to the federal budget. A positive calculated value indicates that the federal budget does not reimburse VAT in favor of the company.
Group 2: Tax burden coefficient				
1.	Coefficient of tax burden on revenue $C_{t.b.rev.}$	Company income tax/ Company revenue	0.02–0.1	It determines the share of the company income tax in the total amount of its revenue.
2.	Coefficient of tax burden on gross profit $C_{t.b.gr.pr.}$	Company income tax/ Company gross profit	0.06–0.15	It is calculated as the ratio of income tax to gross profit.
3.	Coefficient of tax burden on taxable base $C_{t.b.tax.ba.}$	Company income tax / Profit before the company's tax	0.17–0.2	It shows the share of income tax in profit before tax. The statutory income tax rate is 20%, i.e. 0.2. However, the share of income tax in the range from 0.17 to 0.2 is also the norm, as this situation may be associated with the transfer of income tax payments to future periods or the provision of tax benefits under investment agreements, joint projects of regional authorities and corporations.

[3] In particular, Tax Code of the Russian Federation (Part Two) no. 117-FZ, dated August 5, 2000 (as amended on December 22, 2020), Budget Code of the Russian Federation no. 145-FZ, dated July 31, 1998 (as amended on December 22, 2020), On joint stock companies: Federal Law no. 208-FZ, dated December 26, 1995 (as amended July 31, 2020) (e.g. Article 42 "Procedure for payment of dividends by the company", and 43 "Restrictions on payment of dividends"), etc.

End of Table 1

№	Coefficient name	Calculation formula	Normative value	Description
Group 3: Management impact coefficient				
1.	Coefficient of net profit distribution for dividends $C_{n.pr.div.}$	Dividends to stakeholders / Enterprise's net profit	0.4–0.6	It shows the share of dividends in the amount of net profit. Exceeding the standard value indicates the use of the company's net profit in the owners' interests and a decrease in the company's investment potential. However, if less than 40% of the net profit is allocated for the payment of dividends, the company's investment attractiveness for shareholders and investors decreases.
2.	Coefficient of management load on revenue $C_{man.l.rev.}$	Company's management expenses / Company revenue	0.03–0.09	It shows the share of management expenses in total revenue. Exceeding the standard value indicates the use of revenue for the purpose of enriching the company's management personnel.
3.	Coefficient of management load for gross profit $C_{man.l.gr.pr.}$	Company's management expenses / Company's gross profit	0.1–0.2	It is calculated as the ratio of management expenses to the total amount of gross profit. Exceeding the standard value indicates the use of gross profit in the managers' interests.
Source: own compilations.				

At the *second stage* of the assessment, we offer to calculate the indices for the identified coefficients in accordance with the standard values. It is worth noting that when justifying the calculations, we relied on previously developed methodological tools that were successfully tested in Russian regions [28–32]. For the first and second groups, the coefficient growth leads to an increase in the level of financial interaction, so their indices are calculated using the formula:

$$I_{xi} = X_i - X_{min} / X_{max} - X_{min}, \quad (1)$$

where I_{xi} – index for the coefficient;
X_i – coefficient value;
X_{min} – lower limit of norm;
X_{max} – upper limit of norm.

Due to the fact that the growth of coefficients in the third group negatively affects the financial interaction level, the formula for calculating the indices will have the following form:

$$I_{xi} = X_{max} - X_i / X_{max} - X_{min}. \quad (2)$$

Obtaining the calculated values of the indices allows proceeding to the *third assessment stage* which consists in calculating the group indices of financial interaction (I_{BF}, I_{TB}, I_{MI}). Absence of additional weight coefficients, assignment of the indices to equal significance and establishment of a single standard predetermined the use of the arithmetic mean of the indices according to formulas 3–5:

$$I_{BF} = \sum(I_{t.p.} + I_{f.i.t.} + I_{f.b.i.} + I_{f.r.pr.t.} + I_{f.pit.r.} + I_{f.b.val.vat.}) / n, \quad (3)$$

$$I_{TB} = \sum(I_{t.b.rev.} + I_{t.b.gr.pr.} + I_{t.b.tax.ba.}) / n, \quad (4)$$

$$I_{MI} = \sum(I_{n.pr.div.} + I_{man.l.rev.} + I_{man.l.gr.pr.}) / n, \quad (5)$$

where I_{BF} – private budget formation index,
I_{TB} – private tax burden index,
I_{MI} – private management impact index,
n – number of indices in a group.

The final *fourth stage* is the calculation and interpretation of the integral assessment of the financial interaction level between big business and the state (I) based on formula 6:

$$I = \sum(I_{BF} + I_{TB} + I_{MI}) / n. \quad (6)$$

To determine the financial interaction level between big business and the state in accordance with the integral indicator values, we have proposed a scale of intervals and identified seven effectiveness levels.

The first level is "critical": the calculated value of the integral index is below 0.

The role of the company in the regional budget revenues is very small, the VAT reimbursed from the federal budget in favor of the enterprise is much more than the income tax receipts to the federal budget, the enterprise has a low tax burden, the profit tax rate is less than 5%, dividend payments are made even if the financial result is unprofitable.

The second level is "low": the calculated value of the integral index is in the range from 0 to 0.2.

The role of the company in the regional budget revenues is small, VAT reimbursable in favor of the enterprise is greater than the income tax receipts to the federal budget, the profit tax rate varies from 5 to 8%, either the entire net profit is allocated to dividends, or slightly more, management costs lead to a significant reduction in the tax base.

The third level is "satisfactory": the calculated value of the integral index is in the range from 0.2 to 0.4.

The role of the company in the regional budget revenues is insignificant, the amount of VAT reimbursed is equal to the income tax receipts, profit tax rate varies from 8 to 11%, and 80 to 100% of net profit is allocated for dividends. The management workload is quite high.

The fourth level is "average": the calculated value of the integral index is in the range from 0.4 to 0.6.

The company has an average significance in the formation of budget revenues, VAT recoverable amount is lower than the income tax receipts to the federal budget, and profit tax rate varies from 11 to 14%, and from 60 to 80% of net profit is allocated for dividends. Management costs are within the normal range.

The fifth level is "sufficient": the calculated value of the integral index is in the range from 0.6 to 0.8.

The company largely generates regional budget revenues, the amount of VAT reimbursed from the federal budget does not exceed income tax receipts, sufficient tax burden, profit tax rate varies from 14 to 17%, and 50 to 60% of net profit is allocated for dividends.

The sixth level is "high": the calculated value of the integral index is in the range from 0.8 to 1.

Regional budget revenues depend significantly on the results of the enterprise's production and financial activities, the amount of VAT reimbursed is significantly less than income tax receipts to the federal budget, a high level of tax burden, profit tax rate is in the range of 17 to 20%, management costs are insignificant, up to 50% of net profit is allocated for dividends.

The seventh level is "very high": the calculated value of the integral index is above 1.

The company is the main donor of the regional budget revenues, VAT from the federal budget is not reimbursed, the high tax burden, the tax rate within 20%, the interests of shareholders and managers do not go against the socio-economic development of the territories. The dividends amount to about 40% of the net profit, which allows the company to have a high investment potential and accumulate retained earnings.

Thus, the results of interpretation of the integral index values will become the basis for the adoption of state policy measures aimed at expanding cooperation and improving interaction efficiency with large businesses in order to implement the tasks of economic development of the country and its territories.

Research results

The authors propose to carry out testing of the developed methodology on Russian ferrous metallurgy corporations. This is due to the fact that ferrous metallurgy is one of the most developed

and important branches of industrial production, the successful development of which determines the industrial potential and capabilities of many countries including Russia. The industry includes the extraction and processing of raw materials, production of cast iron, steel, rolled products, roofing iron, rail, etc. Consumers of its products are the military-industrial complex, mechanical engineering, automotive industry, construction, pipe production, oil and gas and many other industries[4]. It is no coincidence that the objects of the study are PJSC "Severstal", PJSC "Magnitogorsk Iron and Steel Works" and PJSC "Novolipetsk Steel Works" – Russian enterprises of the ferrous metallurgy industry that are of great importance in their segment in terms of steel production and the formation of regional budgets.

Domestic steel companies Severstal, MMK, and NLMK are the leaders of Russian production and are among the top 50 global companies *(Tab. 2)*.

Among Russian corporations, Novolipetsk Steel became the leader in production growth during the study period (+4.7%). Severstal reduced its production volumes by almost 20%, largely due to the liquidation of Severstal Columbus and Severstal Deaborn production assets in North America. At the Magnitogorsk Iron and Steel Works, reduction in steelmaking volumes was insignificant and amounted to 3.8% from the level of 2012. As a result, the share of Russian companies in global steel production decreased from 2.7% to 2.1%, respectively.

Based on the developed methodology, we will assess the financial interaction level between the state and large corporations in the case of PJSC "Severstal", PJSC "Magnitogorsk Iron and Steel Works" and PJSC "Novolipetsk Steel" in the period from 2010 to 2019. The authors use the financial statements of the companies[5] which are publicly available on the Internet, as well as data from the

Table 2. Steel production of the world's largest companies in 2012–2019.

Company	2012			2015			2019			Change, 2019 to 2012	
	Mil. tn	%*	Place**	Mil. tn	%*	Place **	Mil. tn	%*	Place **	%	Place
Five largest companies											
ArcelorMittal (Luxembourg)	93.6	6.0	1	97.1	6.0	1	97.3	5.2	1	104.0	no change
China Baowu Group (China)	79.1	5.1	4	60.7	3.7	5	95.5	5.1	2	120.7	+2
NSSMC (Japan)	47.9	3.1	2	46.4	2.9	3	51.7	2.8	3	107.9	–1
HBIS Group (China)	42.8	2.7	3	47.8	2.9	2	46.6	2.4	4	108.8	–1
POSCO (South Korea)	39.9	2.6	5	41.9	2.6	4	43.1	2.3	5	108.1	no change
Russian companies											
NLMK	14.9	0.95	20	16.1	0.99	19	15.6	0.83	21	104.7	–1
MMK	13.0	0.80	26	12.2	0.75	31	12.5	0.67	32	96.2	–6
Severstal	15.1	0.96	19	11.5	0.70	33	11.9	0.63	37	78.8	–18
Total	43.0	2.7	–	39.8	2.4	–	40.0	2.1	–	93.0	–

* Share in global steel production.
** Place in the ranking of the 50 largest global companies.
Source: World Steel Association data.

[4] Role of ferrous metallurgy in the global economy. Available at: https://fabricators.ru/article/chernaya-metallurgiya

[5] Financial statement of the PJSC "Severstal". Available at: https://www.severstal.com/rus/ir/results_reports/financial_results/; Financial statement of the PJSC "MMK". Available at: http://mmk.ru/for_investor/financial_statements/dynamics/; Financial statement of the PJSC "NLMK". Available at: https://nlmk.com/ru/ir/reporting-center/financial-releases/

Federal Tax Service[6] and Rosstat for the Vologda[7], Chelyabinsk[8] and Lipetsk[9] Oblasts.

Calculations of the coefficients, proposed in the methodological tools, indicate the following key trends.

First, due to the tenfold increase in income tax in PJSC "Severstal", the corporation's role in generating regional budget revenues has increased which has led to an increase in the regional profit tax rate, as well as the income tax rate for budget revenues. It is worth noting that the period from 2012 to 2015 which was characterized by introducing Consolidated Taxpayers Group and unprofitable financial result of some combines led to a decrease in the role of these corporations in the formation of regional budgets *(Tab. 3)*.

Secondly, the values of the tax burden coefficients relative to revenue and gross profit of PJSC "Severstal" have significantly increased (an increase of 1.5 and 1.6 times, respectively; *Tab. 4*). The highest average tax burden for both revenue and gross profit is typical for PJSC "NLMK" (3.8 and 15.8%), in the second place is PJSC "MMK" (2.5 and 9.0%), in third – PJSC "Severstal" (2.0 and 7.7%), respectively. The reason for the revealed discrepancies between the companies is the absence of a consolidated tax regime in relation to the Magnitogorsk Iron and Steel Works, and its insignificant impact on the tax base of the Novolipetsk Steel Works.

Third, the share of dividends in NLMK's net profit increased 3.7 times during the period, and in 2018–2019, it exceeded its size altogether which led to the use of even a part of retained earnings for this purpose. In the net profit of the Magnitogorsk Iron and Steel Works, the share of dividends increased by 7.1 times. All companies in one period or another were characterized by dividend payments with unprofitable financial results (in 2010, 2011 and 2014 – PJSC "Severstal", in 2014 –

Table 3. Share of profit tax of metallurgical plants in total income tax receipts for the region and in regional budget revenues from 2010 to 2019

Period	Share of corporate income tax in total income tax receipts, %			Share of corporate income tax in regional budget revenues, %		
	PJSC "Severstal"	PJSC "MMK"	PJSC "NLMK"	PJSC "Severstal"	PJSC "MMK"	PJSC "NLMK"
2010	40.4	8,.7	47.4	9,4	1,5	11,6
2011	34.1	10.8	50.2	8,1	1,9	13,1
2012	6.3	9.0	41.8	1,3	1,4	9,1
2013	12.9	0.0	45.7	1,4	0,0	9,1
2014	8.0	0.6	61.5	1,1	0,1	14,9
2015	5.4	30.1	72.5	0,6	6,4	22,3
2016	22.6	37.6	58.4	3,9	8,6	16,6
2017	35.4	30.0	56.1	7,6	7,6	14,9
2018	54.0	38.0	68.2	15,0	10,2	22,7
2019	49.1	29.7	58.7	12,3	6,8	15,7
Average for 2010–2019	26.8	19.5	56.1	6,1	4,4	15,0
2019 to 2010, times	1.2	3.4	1.2	1,3	4,5	1,4
Source: data of the FTS of Russia for the Vologda, Chelyabinsk and Lipetsk Oblasts.						

[6] Official website of the Federal Tax Service. Available at: https://www.nalog.ru/
[7] Territorial authority of the Federal State Statistics Service for the Vologda Oblast. Available at: https://vologdastat.gks.ru/
[8] Territorial authority of the Federal State Statistics Service for the Chelyabinsk Oblast. Available at: https://chelstat.gks.ru/
[9] Territorial authority of the Federal State Statistics Service for the Lipetsk Oblast. Available at: https://lipstat.gks.ru/

Table 4. Share of profit tax on metallurgical plants in revenue, gross profit and profit before tax from 2010 to 2019

Period	Share of income tax in revenue, %			Share of income tax in gross profit, %		
	PJSC "Severstal"	PJSC "MMK"	PJSC "NLMK"	PJSC "Severstal"	PJSC "MMK"	PJSC "NLMK"
2010	2.5	1.0	2.9	9.8	5.7	10.7
2011	2.0	1.1	3.2	9.5	7.4	14.9
2012	0.7	0.8	1.9	3.8	5.0	13.5
2013	0.6	0.0	2.4	3.5	0.0	20.7
2014	0.9	0.1	3.7	3.6	0.2	15.3
2015	0.7	3.5	5.0	2.1	11.4	17.8
2016	1.4	4.6	4.1	4.6	14.8	14.1
2017	3.2	4.1	3.8	11.6	14.0	14.1
2018	4.1	5.4	5.5	13.2	16.6	16.8
2019	3.7	4.0	5.1	15.5	14.6	20.2
Average for 2010–2019	2.0	2.5	3.8	7.7	9.0	15.8
2019 to 2010, times	1.5	4.0	1.8	1.6	2.6	1.9

Source: data of the financial statement of the PJSC "Severstal", PJSC "MMK", and PJSC "NLMK".

PJSC "MMK" and in 2013 – PJSC "NLMK"). The largest average share of dividends in net profit is typical for PJSC "Severstal" (0.89); in second place is the Novolipetsk Plant (0.79), in third place – PJSC "MMK" (0.40) *(Tab. 5)*. This leads to the conclusion that the management of the Magnitogorsk Iron and Steel Works conducts a more restrained distribution policy. This is evidenced by the place of the main owner of PJSC "MMK", Viktor Rashnikov, in the ranking of the richest people in Russia. As of 2020, it loses 11 positions to the owner of PJSC "Severstal", Alexey Mordashov, and 13 positions to the owner of PJSC "NLMK", Vladimir Lisin.

Table 5. Share of dividends in net profit (loss) of metallurgical plants from 2010 to 2019

Period	PJSC "Severstal"		PJSC "MMK"		PJSC "NLMK"	
	Share of dividends in net profit ***	Deviation from the average norm (0,5)	Share of dividends in net profit	Deviation from the average norm (0,5)	Share of dividends in net profit	Deviation from the average norm (0,5)
2010	(0.17)*	-	0.15	-0.35	0.34	-0.16
2011	(8.02)*	-	0	-0.50	0.35	-0.15
2012	0.66	0.16	0.40	-0.11	0.17	-0.33
2013	0.86	0.36	0	-0.50	(0.31)*	-
2014	(4.71)*	-	(2.85)*	-	0.73	0.23
2015	1.23	0.73	0.32	-0.18	0.83	0.33
2016	0.80	0.30	0.32	-0.18	1.52	1.02
2017	0.71	0.21	0.46	-0.04	0.77	0.27
2018	1.08	0.58	0.90	0.40	1.16	0.66
2019	0.92	0.42	1.07	0.57	1.25	0.75
Average for 2010–2019	0.89	0.39	0.40	-0.10	0.79	0.29
2019 to 2010, times	–	–	7.1	-1.6	3.7	-4.7

* Share of dividends in the loss is in parentheses.
** Excluding dividend payments in case of losses.
*** In net profit.
Source: data of the financial statement of the PJSC "Severstal", PJSC "MMK", and PJSC "NLMK".

It is worth noting that tax optimization through dividends is undesirable, as it can lead to abuse; investment promotion should be carried out by directly linking the amount of capital investment and tax benefits (for example, through tax deductions for certain types of investments).

Fourth, management loan on revenue for 10 years decreased by 0.3 p. p. at PJSC "Severstal"; by 1.4 p. p. at PJSC "MMK" and increased by 0.2 p. p. at the Novolipetsk Plant. However, this situation can be regarded as a deliberate preservation of net profit volume for implementing dividend payments. The largest volume and share of management expenses in terms of revenue and gross profit for all metallurgical plants occurred in 2012 and 2013. Magnitogorsk Iron and Steel Works reduced management expenses in the structure of gross profit by 10.6 p. p. *(Tab. 6)*.

Next, we will proceed to the calculation of the integral coefficient of financial interaction level between the state and large corporations.

The financial interaction level between PJSC "Severstal" and PJSC "NLMK" with the state has decreased by 36% and 11%, respectively, over the previous 10 years, while that of PJSC "MMK" has increased by 32% *(Fig. 4)*.

The decrease in income tax receipts from PJSC "Severstal" to the Vologda Oblast budget as a result of creating a consolidated group of taxpayers, as well as increasing in dividend payments at losses, affected the financial interaction level which in the period from 2012 to 2016 can be described as critical.

After 2016, there was a convergence of the financial interaction level between the three studied corporations and the state which allows formulating the following conclusions regarding the assessment of interaction efficiency level between the state and the studied corporations for 2010–2019:

– the level of state-corporate financial cooperation was mainly assessed as low;

– except a sharp drop in 2014, the efficiency level was approximately at the same level which indicates the stagnant operation of the interaction mechanism;

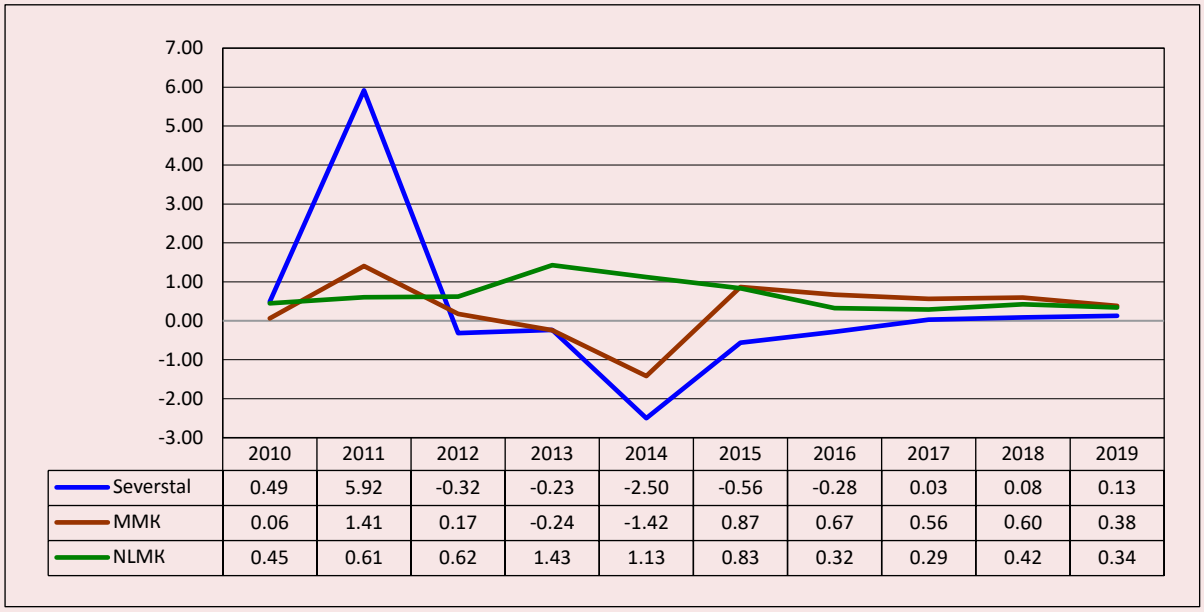
– dynamic trend of interaction assessment indicates a sharp drop in its level in 2014 which is explained by the payment of dividends to shareholders the amount of which repeatedly exceeded the amount of losses;

– the financial interaction level between PJSC "Severstal" and the state was mainly assessed as "critical" and "low";

Table 6. Share of management expenses in the structure of revenue and gross profit of metallurgical plants from 2010 to 2019, %

Period	Share of management expenses in revenue, %			Share of management expenses in gross profit, %		
	PJSC "Severstal"	PJSC "MMK"	PJSC "NLMK"	PJSC "Severstal"	PJSC "MMK"	PJSC "NLMK"
2010	3.7	3.0	3.4	14.9	16.6	12.6
2011	3.7	2.7	3.2	17.5	18.5	14.9
2012	5.3	3.1	3.3	28.4	19.2	22.9
2013	4.4	3.2	3.8	24.4	24.3	33.0
2014	3.8	2.5	3.8	14.1	10.9	15.7
2015	3.4	1.9	3.0	10.1	6.1	10.8
2016	3.7	1.7	4.1	12.0	5.5	14.3
2017	3.3	1.6	3.3	11.9	5.4	12.3
2018	3.0	1.4	3.3	9.4	4.4	10.0
2019	3.4	1.6	3.6	14.4	6.0	14.2
Average for 2010–2019	3.8	2.3	3.5	15.7	11.7	16.1
2019 to 2010, times	-0.3	-1.4	+0.2	-0.5	-10.6	+1.6
Source: data of the financial statement of the PJSC "Severstal", PJSC "MMK", and PJSC "NLMK".						

Figure 4. Dynamics of integral coefficient of financial interaction of metallurgical corporations with the state from 2010 to 2019



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Severstal	0.49	5.92	-0.32	-0.23	-2.50	-0.56	-0.28	0.03	0.08	0.13
MMK	0.06	1.41	0.17	-0.24	-1.42	0.87	0.67	0.56	0.60	0.38
NLMK	0.45	0.61	0.62	1.43	1.13	0.83	0.32	0.29	0.42	0.34

Source: own compilations.

– the highest estimates were for the financial interaction between the state and PJSC "NLMK" which is due to the estimated profit tax rate and the significant role of the company in the regional budget revenues;

– all corporations used the profits to a greater or lesser extent for the owners' benefit (paying significant amounts of dividends even with losses).

Conclusion and suggestions

Carried out with the help of the developed methodological tools, the assessment of trends in interaction of metallurgical corporations and the state indicates that the financial interaction of these economic agents is not sufficiently effective. During the period, the mechanism of corporate governance has become so strong that it can build an alternative vertical of corporate power to state power which primarily meets the corporation needs, and already on a residual basis – the population needs of the home territories. Moreover, the current corporate governance mechanism continues to be supported by government policy measures, which is confirmed by the growing number of trading transactions, the unhindered opportunities to direct financial flows in favor of the final offshore beneficiaries, and the existence of legal ways to optimize tax. If Russian legislation limited such assumptions, the budget population security in the regions where large corporations are based could significantly increase improving the quality of public services and living standards.

The study has showed that drastic measures are required to improve the fiscal function of large corporations that:

– first, they assume an inventory of the rules governing the taxation of profits in order to exclude the institutional opportunities for corporations to implement tax optimization;

– second, they are reviewing the mechanism for returning export VAT and adjusting the approaches to applying the zero VAT rate for export operations.

Projects of budget-forming enterprises should not contradict the strategies of territorial development of the region, but comply with the principles of social partnership and social responsibility of business.

From this point of view, there is an urgent need to create and scientifically substantiate the organizational and economic mechanism of interaction between the state and large corporations which will contribute to realization of constitutional rights of citizens, correspond to national goals and priorities, as well as be linked to the tasks and instruments of state financial policy.

This study contributes to the development of theoretical science and forms the basis for further reflection on the financial interaction assessment of corporations and the state. It is worth noting that our further research is supposed to focus on the in-depth identification of the causal relationships of obtaining such evaluation results that significantly deviated from the regulatory level, as well as development of measures aimed at improving interaction effictiveness between the state and large corporations, and organizational and economic mechanism.

In addition, the results of the work can be used by the state authorities of the entities of the Russian Federation in assessing the contribution of corporations to replenishment of regional budgets and forecasting threats to reduce the budget security of territorial systems.

References

1. Khil'ko N.A., Karginova V.V. Corporate modernization of the economy is a necessary condition for increasing its competitiveness. *Prostranstvo ekonomiki=Terra Economicus*, 2009, no. 2–3, pp. 45–49 (in Russian).
2. Dobroleja E.V. Implication of large corporations' financial resources into socio-economic potential of Russian regions. *Natsional'nye interesy: prioritety i bezopasnost'=National Interests: Priorities and Security*, 2011, no. 36 (129), pp. 59–63 (in Russian).
3. Ilyin V.A., Povarova A.I., Sychev M.F. *Vliyanie interesov sobstvennikov metallurgicheskikh korporatsii na sotsial'no-ekonomicheskoe razvitie* [Influence of Metallurgical Corporation Owners' Interests on Socio-Economic Development]. Vologda: ISEDT RAS, 2012. 102 p.
4. Ilyin V.A., Povarova A.I. *Vliyanie metallurgicheskikh korporatsii na formirovanie dokhodov regional'nykh byudzhetov (2007–2016)* [Influence of Metallurgical Corporations on the Formation of Regional Budget Revenues (2007–2016)]. Vologda: VolRC RAS, 2019. 198 p.
5. Ilyin V.A., Povarova A.I. *Krupneishie metallurgicheskie korporatsii i ikh rol' v formirovanii byudzhetnykh dokhodov: monografiya* [Largest Metallurgical Corporations and their Role in the Formation of Budget Revenues: Monograph]. Vologda: VolRC RAS, 2019. 204 p.
6. Povarova A.I. Metallurgical regions: Key trends and socio-economic development issues. *Problemy razvitiya territorii=Problems of Territory's Development*, 2015, no. 6 (80), pp. 37–50 (in Russian).
7. Budanov I.A. Management of the development of metallurgy and the global metal market. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 2020, no. 6, pp. 104–118 (in Russian).
8. Tyurina Yu.G. Methodological and practical problems of the regional tax potential evaluation. *Izvestiya OGAU=Izvestia of Orenburg State Agrarian University*, 2013, no. 6 (44), pp. 155–157 (in Russian).
9. Creedy J., Gemmell N. Corporation tax asymmetries: Effective tax rates and profit shifting. *International Tax and Public Finance,* 2011, vol. 18, pp. 422–435.
10. Park J., Lee Y. Corporate income taxes, corporate debt, and household debt. *International Tax and Public Finance,* 2019, vol. 26, iss. 3, no. 3, pp. 506–535.
11. Reito F., Spagano S. Joint liability taxation and group auditing. *Economia Politica,* 2017, vol. 34, pp. 305–327.

12. Abdullahi D.A. Effects of financial liberalization on financial market development and economic performance of the SSA region: An empirical assessment. *Economic Modelling,* 2013, vol. 30, pp. 261–273. DOI: https://doi.org/10.1016/j.econmod.2012.09.019
13. Arendsen R., Oscar Peters O., Hedde M., Dijk J. Does e-government reduce the administrative burden of businesses? An assessment of business-to-government systems usage in the Netherlands. *Government Information Quarterly*, 2014, vol. 31, iss. 1, pp. 160–169.
14. Leibus I. Assessment of agricultural tax burden in Latvia. *Economic Science for Rural Development Conference Proceedings*, 2017, vol. 46. pp. 272–278.
15. Giriiniene G. Analysis of assessment methods of tax burden: Theoretical aspect. *Economics and Management,* 2012, vol. 17, no. 3, pp. 823–828. DOI: https://doi.org/10.5755/j01.em.17.3.2089
16. Gudelis D., Guogis A. Integrating public and business management: A model of interaction between public and private sectors. *Int Rev Public Nonprofit Mark,* 2011, vol. 8, pp. 1–9. DOI: https://doi.org/10.1007/s12208-010-0063-4
17. Maksimova T.V. Calculation of tax burden of the economic entity: Theory and practice. *Vestnik YuUrGU. Seriya «Ekonomika i menedzhment»*=Bulletin of South Ural State University, Series "Economics and Management", 2015, vol. 9, no. 2, pp. 110–116 (in Russian).
18. Kirova E.A. Methodology for determining the tax burden on business entities. *Finansy=Finance*, 1998, no. 9, pp. 30–42 (in Russian).
19. Litvin M.A. Tax burden and economic interests of enterprises. *Finansy=Finance*, 1998, no. 5, pp. 29–31 (in Russian).
20. Pchelintsev O.S., Minchenko M.M. Regional infrastructure as a condition for economic growth. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 2004, no. 6, pp. 1–16 (in Russian).
21. Ilyin V.A., Morev M.V., Povarova A.I. Russian "capitalism for the few" (case study of major ferrous metallurgy corporations). *Obshchestvo i ekonomika=Society and Economy*, 2019, no. 12, pp. 22–58. DOI: 10.31857/S020736760007835-7 (in Russian).
22. Ilyin V.A. Private capital and national interests. A case study of metallurgical corporations' owners. *Vestnik Rossiiskoi akademii nauk=Herald of the Russian Academy of Sciences*, 2013, no. 7, pp. 579–586 (in Russian).
23. Ilyin V.A., Povarova A.I. Consolidated taxation and its consequences for regional budgets. *Ekonomika regiona=Economy of Region*, 2019, no. 4, pp. 70–83. DOI: 10.17059/2019-1-6 (in Russian).
24. Ilyin V.A., Povarova A.I. Failures of big business tax administration and their impact on regional budgets. *Ekonomika regiona=Economy of Region*, 2017, no. 1, pp. 51–57 (in Russian).
25. Andreeva E.S. Evaluation of the effectiveness of public-private partnership projects: A methodological approach. *Vestnik Kazanskogo tekhnologicheskogo universiteta=Bulletin of the Kazan Technological University*, 2013, no. 12, pp. 300–303 (in Russian).
26. Malyshev M.K. On the social responsibility of big business (case study of PJSC "Severstal"). *Sotsial'noe prostranstvo=Social Area*, 2020, vol. 6, no. 1. Available at: http://socialarea-journal.ru/article/28502. DOI: 10.15838/sa.2020.1.23.5 (in Russian).
27. Malyshev M.K. The role of big business in the development of territories (illustrated by steel-making corporations of Russia). *Vestnik Rossiiskogo ekonomicheskogo universiteta imeni G.V. Plekhanova=Vestnik of the Plekhanov Russian University of Economics*, 2020, no. 17 (6), pp. 144–155. DOI: https://doi.org/10.21686/2413-2829-2020-6-144-155 (in Russian).
28. Pechenskaya M.A. Budget potential of municipal entities: Assessment and directions for development (on the example of Vologda Oblast). *Problemy prognozirovaniya=Studies on Russian Economic Development*, 2019, no. 4, pp. 120–131 (in Russian).
29. Pechenskaya M.A. Region and federal center: State and evaluation of the effectiveness of budgetary relations. *Audit i finansovyi analiz=Audit and Financial Analysis*, 2013, no. 5, pp. 397–404 (in Russian).

30. Pechenskaya-Polishchuk M.A. Instruments and principles of reallocating budgetary resources in the region. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2020, vol. 13, no. 2, pp. 71–88 (in Russian).

31. Gubanova E.S., Kleshch V.S. Methodological aspects in analyzing the level of non-uniformity of socio-economic development of regions. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2017, vol. 10, no. 1, pp. 58–75. DOI: 10.15838/esc.2017.1.49.4 (in Russian).

32. Yashin S.N., Korobova Yu.S. A method for calculus of integral index of the region's innovative development. *Finansovaya analitika: problemy i resheniya=Financial Analytics: Science and Experience*, 2017, no. 4 (334), pp. 360–374 (in Russian).

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Semantic Space of Reality: Structural Taxonomy of the Foundations of Self-Regulation of Interactions in the Youth Environment

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Abstract. The article provides a conceptual understanding of the semantic space of reality, substantiates its structure and features of its formation in the youth environment. To this end, we consider the process of meaning formation and the content of semantic fields. It is analyzed as the basis for self-regulation of social interactions between young people. Identifying semantic foundations of self-regulation is a relevant research task for both theory and practice. The aim of the study is to identify the structure of relationships and hierarchical clustering of basic elements in the mechanism for self-regulation of social interactions in the youth environment with the help of the structural and taxonomic model. The model was constructed within the framework of the tool for self-regulation of young people's daily life; the tool is being developed at the Center for Youth Sociology, Institute of Socio-Political Research, Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences (ISPR FCTAS RAS). The structural and

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taxonomic approach allows us to obtain structural-taxonomic maps that display multi-layered structures of relationships within the mechanism of self-regulation, as well as connections between different meanings that are reproduced and constructed in the youth environment in the process of everyday interactions. In contrast to the automatic classification as the classical task of taxonomy, the structural and taxonomic approach focuses on identifying the structure of the most significant relationships between the objects being classified; such objects (which are considered in the present paper) are the elements of self-regulation mechanism in the life of young people. We design a structural and taxonomic model using the data of a sociological survey; this allows us to offer reasonable descriptions and explanatory interpretations of the results. The analysis is based on the findings of empirical studies we obtained in the course of a survey of Russian youth 15–29 years of age. We use taxonomic analysis to reveal the structure of the semantic space of young people. We conclude that semantic connections within and between semantic fields are ambiguous. Having implemented structural and taxonomic modeling of the semantic space, we identify several levels of semantic fields. Their analysis allows us to form an idea of the semantic foundations of self-regulation of young people's interactions with each other and with society.

Key words: self-regulation, interactions, meanings, social reality, youth, structural taxonomy, hierarchical clustering.

Introduction

In the course of sustainable development of a society its parameters are maintained within a certain range by the younger generation; this ensures the continuity of self-regulation patterns. But in socio-cultural dynamics, experience is not only reproduced, but also reinterpreted; as a result, different socio-cultural patterns related to the markers of different historical periods emerge in the space of young people's concepts and meanings. In accordance with the "correlation" between young people's experience and certain meanings, socio-cultural samples are selected, which serve as the basis for the reality images and the way young people interact with each other and with society. As a result, interactions that are similar in form are filled with different meanings, and the meanings themselves undergo transformation and in a new and altered form serve as the basis for self-regulation of social interactions.

The formation of the semantic space of reality is accompanied by cognition, comprehension and mastering of reality. The key place in this process belongs to the subjective interpretation of objects, events and phenomena of reality, i.e., endowing them with special concepts and meanings. The meaning contains young people's understanding of the essence of everything that fills their life and at the same time acts as a "discrete impulse of a special kind of intentionality" [1]. This implies that the meanings that have been formed as representations of the essence of real objects and their significance for life penetrate into the structure of motivation of life activity, where they take the form of values. In turn, values – ideas about meanings formed in the collective consciousness of young people – fill interactions with the content of world outlook.

The cognition of reality and the construction of meanings take place not only in the everyday interactions of young people with each other, but also in intergenerational communication. In turn, the subjective understanding of meaning serves as the basis for self-regulation of young people's social interactions (both in the youth environment and in society as a whole), giving a meaningful orientation to group and interpersonal interactions.

The sources that shape meanings include, on the one hand, historical experience in the form of historical memory as a product of socio-cultural development of society contained in the collective unconscious; on the other hand, young people's specific living conditions, in which they obtain life experience and in which their socialization takes place. The interaction of these meanings reflects both differentiation and syncretism, so the differentiation of meanings and their carriers is accompanied by an even more complex process of layering different patterns in the minds of the same groups. Since fundamental changes do not occur simultaneously, there are different, often contradictory, concepts and meanings in the semantic space of reality.

Understanding the formation of meanings and the content of semantic space **requires an in-depth study of the mechanisms that form semantic projections;** this is associated with an answer to one of the key questions about the interaction of unconscious and conscious, social and cultural, traditional and modern elements within the mechanism of social self-regulation.

Methodology

When analyzing young people's semantic space, its formation and further influence on the self-regulation of interactions we use a holistic approach that takes into account various elements of the *self-regulation mechanism* – archetypal, mental, habitual and stereotypical components, meaning-of-life values, types of culture, and trust in other people.

Structural and taxonomic modeling was used to analyze the meanings and identify the functions of elements of the mechanism in the structuring of the semantic space of young people's reality [2; 3, pp. 87–94; 4, pp. 95–98; 5, pp. 147–152]. It allows us to understand the process of meaning formation and semantic self-regulation and to identify its features that are not easily identified with the help of standard research methods.

The method of structural and taxonomic analysis (modeling) is a set of *formalized procedures* for hierarchical clustering or automatic classification; procedures for structural and taxonomic interpretation of the obtained partitions; structures of the most significant (according to the criterion of "maximum proximity") relationships between the image parameters ("subjects") and between the selected taxa (semantic groupings/associations). The significance of meanings is determined by calculating the closeness of the relationship between the indicators. The algorithms allow us to identify automatically the elements closest to each other by a sufficiently large number of parameters and group these elements into *natural* taxa classes. Thus, the meanings corresponding to the elements are not distributed randomly, but are arranged in a certain hierarchy in accordance with the values of the proximity measure selected. *In this sense, each taxon defines a subspace for a specific semantic field, and in the aggregate, the semantic fields corresponding to the resulting taxa, considered in their relationship with each other, form the structure of semantic space (groupings of taxa).*

The results of the first experience of taxonomic analysis contained initial data on the semantic fields corresponding to the selected taxa, and an analysis of the correlation of these taxa with specific manifestations of youth self-organization [6, pp. 15–35; 7, pp. 59–75]. In the present article, we focus on the key features of the semantic space of reality, which are the grounds for self-regulation of young people's interactions with those around them[1].

[1] The initial data for the structural taxonomy were drawn from the results of a sociological study conducted by the Center for Youth Sociology of ISPR RAS in 2017 in seven constituent entities of the Russian Federation, in 28 localities. The sample of young people 15–19 years of age included 803 people. The survey was conducted by a personal interview at the place of residence of respondents. The survey was supervised by Yu.A. Zubok and V.I. Chuprov.

Image elements that present the main parts of the mechanism of self-regulation of young people's life activity developed by the Center for Youth Sociology of ISPR RAS were used as image elements ("subjects" in the contingency table) [8; 9, pp. 14–19; 10, pp. 164–186; 11, p. 48; 12]: *archetypes* identified on the basis of the proverbs with which young people agree and which contain samples of the collective unconscious; *mental (traditional) and modern features of worldview attitudes* that are directly related to the *specific features of national character* and that are noted by young people as *features of their own generation*; *the meanings of life as an understanding of its essential dominant; types of culture* constructed on the basis of P.A. Sorokin's approach; *meanings* that arise within the framework of youth subcultures and that are the main principles of intra-and inter-group interactions; *habitus* as established behavioral practices; basic *trust/distrust* in others.

The normalized Euclidean metric was used as a measure of proximity. The image elements representing young people's semantic space were divided into natural (previously undefined) taxa classes according to the "nearest neighbor" method (maximum proximity criterion) in a seven-dimensional coordinate system defined by the features of young people's attitude toward others.

In contrast to the Pearson correlation coefficient, which represents one of the angular proximity measures in the structural taxonomy that allows us to obtain structural distributions of image elements by the criterion of maximum ***proximity in orientation***, grouping by the criterion of the smallest Euclidean distance between image elements makes it possible to divide the entire set of images directly by their ***metric proximity*** in a multidimensional characteristical space.

The semantic space of reality: structure and dynamics

The fundamental basis of meanings includes the archetypal and mental components of culture that contain a generalized image of the past[2] and reflect national specifics of organization of the life of people who were socialized *within the framework of a common culture and territory* [12; 13]. This is "a way of people's perception and evaluation of their surrounding world, their way of thinking and feeling, which has a supra-situational character and manifests itself in their specific behavioral activity" [14]. Archetypes are present in the collective unconscious in the form of myths, sayings, fairy tales. Being passed down from generation to generation, they participate in the formation of the "core" of people's firm ideas about themselves and the social world. According to Ya.E. Golosovker, archetypal elements represent a set of "semantic images of culture" [15]. They shape ideas about events and phenomena in the form of the unconscious, when they are not yet subjected to conscious reflection, but are the object of experience. Semantic images play an important role in people's search for the meaning of their life, ways of arranging it, highlighting its main goals and means of achieving them.

Archetypal and mental patterns reflect the ways of understanding associated with broad layers of culture. Being enshrined in stable images of reality (stereotypes) and habitual social practices (habitus), they turn into an active behavioral form. The "practical meaning" that determines the content of habitus reflects people's past experience, connects it with the present and becomes an integral part of their life activity. A stereotype as a simplified image of the attitude toward certain objects is used to classify them and refer them to a certain meaning. Based on clichés and template representations, a stereotype levels the details of the images of reality, reducing the meaning to a "frame" or a "contour". As the products of socialization, stereotypes are

[2] Jung K.G. *Arkhetip i simvol* [Man and His Symbols]. Moscow: Renessans, SP IVO-SiD, 1991. Available at: https://www.phantastike.com/archetype/arhetip_i_simvol/zip/ (accessed May 28, 2020).

formed as mechanisms for identifying "insiders" ("us") and "outsiders" ("them"). Common simplified images and ready-to-use behavioral attitudes based on historical and current experience affect the emotional perception of reality.

Acting as a product of joint activity, meanings are felt emotionally as the closeness and similarity of views and ideas about reality, which are shared with other people. Along with the comprehension of the common reality, awareness of involvement in the same events and phenomena, and most importantly, their similar interpretation, the sensations that people experience move to the conscious level. Conscious meanings are given an axiological value; they are transformed into effective regulators of consciousness and behavior. Thus, *a semantic space of reality* is formed, in which the meanings themselves, the objects that are endowed with the meanings, and the carriers of these meanings – individuals and groups –interact. Space is a form of existence of both objective and subjective worlds, "a fundamental ... concept of human thinking that reflects the multiple nature of the existence of the world, its heterogeneity. A multitude of things and objects, existing in human perception simultaneously, forms a complex spatial image of the world, which is a necessary condition for the orientation of any human activity"[3].

Rational, irrational, and emotional impressions about objects, actors, events and phenomena of the material and spiritual world are perceived by people on the basis of a stable meaning or an idea, which is embedded in them[4]. At the same time, the image, once in a certain context, is able to generate meanings. But the meanings that already exist in this context, in turn, generate images that do not necessarily prove viable.

In the process of socialization, young people "master and appropriate" meanings[5]. *The set of subjective images of reality formed in the process of interaction of individuals and groups with each other and with the environment, included in the process of self-regulation, constitutes a semantic space of reality*.

Semantic space consists of many social fields, each of which is understood as "the unity of meanings and concepts, processes and results of the cognitive-discursive activity of an individual and society" [16]. A semantic field is a construct, a set of meanings and their interrelations in a multidimensional context space.

In the process of interaction between the environment and the individual, and between the individual and culture, collectively developed meanings are translated into personal concepts, and concepts are translated into meanings", while "meanings are subjectified, and concepts are objectified" [16, p. 321]. The meaning is considered not as a "static finished product", but as a result of the process of its construction and reconstruction, which is due to the real life relationships of the actor and his/her individual practice.

[3] In the humanities, the concept of space is used quite often. Examples include "virtual space", "anthropogenic landscapes", "sociodynamics of culture", "semantic space" (psychosemantics, V.F. Petrenko), "social topology" (sociology, P. Bourdieu), "ecological and structural space" (social anthropology, E. Evans-Pritchard), "ethnic fields" (L. Gumilev). As applied to social and humanitarian knowledge, these concepts, as a rule, represent a conceptual borrowing from the natural and exact sciences. "Cultural studies, historical geography, psychology, sociology, linguistics reveal the historical, cultural and social content of the concept of space, which arose and existed for a long time as a form of pre-and extra-scientific knowledge, as a category of culture, along with other cultural universals" (Ivin A.A. Filosofiya: *Entsiklopedicheskii slovar'* [Philosophy: Encyclopedic Dictionary]. Moscow: Gardariki, 2004. Available at: https://dic.academic.ru/dic.nsf/enc_philosophy/994/%D0%9F%D0%A0%D0%9E%D0%A1%D0%A2%D0%A0%D0%90%D0%9D%D0%A1%D0%A2%D0%92%D0%9E (accessed April 6. 2021).

[4] Averintsev S. *Sobr. soch. Sofiya – Logos. Slovar'* [Collected works. Sophia – Logos. Dictionary]. K., 2006. Pp. 386–387.

[5] Kovaleva A.I., Gnevasheva V.A., Seliverstova N.A. Val. A. Lukov's thesaurus-based concept of youth. In: *Sotsiologiya molodezhi: elektronnaya entsiklopediya* [Youth sociology: electronic encyclopedia]. Available at: http://soc-mol.ru/encyclopaedia/theories/173-tezaurusnaya-koncepciya.html (accessed July 29, 2015).

Considering semantic fields as ways of functioning of meanings and relying on the work of psychologists and linguists (D.A. Leontiev, A.V. Kravchenko, Y. Zlatev, etc.), N.I. Kurganova writes the following: "Meanings are constructed by actors and at the same time ... are directed through collectively developed meanings. ... Due to the continuous interaction of collective and individual knowledge, the semantic field is constantly updated in its various components and aspects, while maintaining a certain *stable core*, which is a set of the most typical and regularly reproduced strategies, schemes, models and cognitive operations. This *operational core* sets the dynamics of the semantic field and underlies the formation of shared knowledge. It follows from this that the essence of the development of culture is reduced ... to mastering the ways of understanding the world in accordance with cultural models".

As a result, "being united by the commonality of language, space and time, people develop a common *set of ways of acting* with the world, i.e., ways of *meaning formation* that are regularly reproduced in the processes of cognition and communication" [16, p. 322].

Value systems, according to P.A. Sorokin, determine the semantic content of life activity and serve as the basis for classifying the semantic space of reality. "Each of the large cultural systems and super-systems is based on ... a pra-symbol or final value that a civilization generates, develops and implements throughout its life path in all its main components or subsystems" [17, p. 48]. According to P.A. Sorokin, integral cultural super-systems reflect *basic semantic projections* typical of many societies [18, p. 431]. The basic types of culture contain stable concepts with a set of fundamental values that are at the center of the thesaurus of most carriers of this culture. They are not realized, but "pop up in the form of ideas about certain problems or objects, encouraging people to perform actions, determining their orientation and predetermining the perception of the world" [19, p. 11]. Being the connecting threads between society and the younger generation, the basic types of culture influence its interactions.

However, despite the general similarity, basic types of culture differ not only in the degree of expression of their corresponding values, but also in the meaning that is invested in them from one epoch to another, from society to society, from one group to another. As a result of the new experience and the "new time" there emerge new contexts and new social interactions; they force the younger generation to reconsider the concepts and meanings of familiar phenomena. Different semantic fields are formed, in which the features of intra-group interactions of young people who are growing up/socializing in modern society are transformed into characteristic features of the generation. The formation of such fields is a function of youth subcultures, in which "social reality is constructed and redesigned" [20, p. 8]. *Together, basic and modern cultural types are elements of the semantic space of the younger generation and regulators of their interactions.*

The modern semantic space of reality is formed under the influence of significant globalization and at the same time holds and contains the projections of local cultures with their recognizable traditional content. "The past is reinterpreted so as to satisfy the current reality" [21, p. 263]. In this regard, basic meanings are supplemented and expanded, new types of culture appear on their basis: adaptive culture (the value of security and self-preservation), hedonistic culture (the value of pleasure and impressions), the culture of moral anomie (the value of emancipation and independence). In a broader sense, they are reflected in the change in the general semantic vector identified by R. Inglehart [22, p. 347] as a shift from survival ("material") to self-expression ("post-material"), from religious spirituality to secular rationality, from traditionalism to modernity.

However, in reality, this process leads to the coexistence of traditional and modern models with their characteristic meanings. Based on their combination, value structures are formed that reflect the local and global, traditional and modern, value and rational [23, pp. 173–189]. The phenomenon of *socio-cultural hybridization* of models of projective perception[6] and structuring of social reality [3; 4; 5] is manifested in the youth environment as one of its main features.

Taxonomic analysis of semantic configurations

Structural and taxonomic modeling was used to classify main indicators of the semantic space [24]. The table of contingency of indicators of the semantic space of Russian youth, built on the results of a specific sociological study conducted in 2017, served as the initial information model. The normalized Euclidean metric was used as a measure of proximity; 48 indicators of the mechanism of self-regulation of young people's life activity ("subjects" in the contingency table) were selected as image elements that define the semantic space of Russian youth; seven features of self-organization of young people ("predicates" in the contingency table) served as the basis that defines the context[7].

The whole set of image elements representing the semantic space of Russian youth was divided in a seven-dimensional coordinate system, set by the basic features of youth self-organization, into previously unknown, so-called "natural" classes (taxa) according to the "nearest neighbor" method (maximum proximity criterion).

The image elements were grouped according to the criterion of the smallest Euclidean distance in a multidimensional characteristical space.

The result of the taxonomy of the first level of image indicators is 13 taxa that reflect the structure of relationships between the indicators of the mechanism of self-regulation of young people's life activity in the space of the context of self-organization. The resulting structural map, in fact, is a representation of the semantic space of the life activity of Russian youth in 2017.

Taxa have their own semantic configuration. Each taxon is represented by a core, at least. Some have a more complex, multi-layered structure that represents semantic complexes.

The core of the taxon has the greatest expression and influence on self-regulation. It defines the main meaning of interaction, and additional layers expand this meaning.

Along with the analysis of the meanings that determine/define the semantic space of youth consciousness, taxonomic analysis shows the localization and roles of all elements of the self-regulation mechanism considered in their interrelation in the structural hierarchy, providing an opportunity to see in what combinations (sometimes unexpected ones) they manifest themselves, and, accordingly, to construct reasonable hypotheses on their interaction with each other.

When conducting the taxonomy of the second level, taxa can be combined into groups, forming semantic fields with a more complex structure. In this analysis, at *the second level of division, three groups of taxa – Group A, Group B and Group C – were identified*. Each group has its own core and its own layers. The number of taxa included in the groups and the number of layers in different groups is not set in advance; rather, "natural" group classes (taxa of the second level of division) are allocated. In them, not only the semantic configuration is even more clearly traced, but also the meaning of a concept or a group of concepts in their

[6] Lyubutov A.S. *Metod proektivnoi strukturizatsii ob"ekta sotsial'noi prirody: dis. ... kand. tekhn. nauk* [The method of projective structuring of an object of social nature: Candidate of Sciences (Engineering) dissertation]. Moscow, 2000. 169 p. (05.13.16 – Application of computer technology, mathematical modeling and mathematical methods in scientific research)

[7] 1) Solidary relations in the labor collective; 2) competitive relations in the labor collective; 3) solidarity of the "staunch collectivist" type; 4) solidarity of the "staunched individualist" type; 5) lack of desire to unite with peers; 6) there is a desire to unite with peers; 7) pronounced desire to unite with peers.

Distribution of semantic configurations

Group "A"			
Taxa		***Core*** **(first layer)**	***Layer structure of images*** **(second layer and above)**
Taxon 1		***spiritual culture*** + ***"idealization of the past"*** (archetype)	***honor, dignity*** (mental trait)
			love for one's neighbor (mental trait)
			trust in others
			adaptive culture
			hedonistic culture
			love for one's motherland (mental trait)
			aproactive approach to life (habitus)
Taxon 2		***constancy*** (habitus) + ***predictability*** (habitus)	***good*** (archetype)
			mercy, compassion (mental trait)
Taxon 3		***moral anomie*** (type of culture) + ***feeling of being chosen, exclusivity*** (subculture)	***desire to be in the center of attention, to shock others*** (subculture)
Core of Group "A"	**Taxon 4**	***glory*** (archetype) + ***love*** (meaning-of-life value)	***conscience*** (archetype)
			the "us –them" confrontation (stereotype)
	Taxon 5	***kindness*** (archetype) + ***compassion*** (modern trait)	***desire to defend human rights*** (modern trait)
			sensuality (habitus)
Taxon 6		***physical development*** (type of culture) + ***self-expression, desire to be different from others*** (subculture)	***innovativeness*** (type of culture)
Group "B"			
Core of Group "B"	**Taxon 7**	***attitude toward the country as a place of residence*** (modern trait) + ***faith in the savior*** (archetype)	---
	Taxon 8	***protest against officialism*** (subculture) + ***openness to everything foreign*** (modern trait)	***freedom without restrictions*** (subculture)
Taxon 9		***rationalism*** (modern trait) + ***guilt and obedience*** (archetype)	---
Taxon 10		***quiet, comfortable life*** (meaning-of-life value) + ***retreat into oneself, escapism*** (subculture)	***suspicious attitude toward foreigners*** (mental trait)
			self-realization (meaning-of-life value)
Group "C"			
Core of Group "C"	**Taxon 11**	***pursuit of truth*** (meaning-of-life value) + ***rightness of power*** (archetype)	***continuation of oneself in future generations*** (meaning-of-life value)
			struggle for justice (meaning-of-life value)
	Taxon 12	***prudence*** (habitus) + ***risk*** (habitus)	***change*** (habitus)
Taxon 13		***distrust*** (attitude) + ***passive life position*** (habitus)	***political struggle*** (meaning-of-life value)

Source: own compilation.

structural hierarchy. The distribution of semantic configurations is presented in the *Table*.

The core of Group A – its most significant part – consists of Taxa 4 and 5. The table shows that they are a combination of traditional and modern semantic projections, thereby reflecting the phenomenon of hybridization and cultural mix discussed above. The archetype of glory nourishes the meaning-of-life value of love, and the archetype of kindness – compassion as a modern form of sympathy for others. These semantic combinations are strengthened by the archetype of conscience as an internal ability for moral reflection, supplemented and expanded by sensuality as the basis of interactions, and embodied in the desire to defend human rights as a modern value. It is noteworthy that human rights as a modern value, compassion as a modern trait, and the archetype of good fall into one taxon, and therefore into one semantic field. This combination indicates the specifics of formation of modern features of social interactions that are closely related to the deep layers of culture, which go down into the collective unconscious, so their strengthening is not always due to the destruction of traditional values. For example, strengthening takes place in the case of human rights. The same conclusion can be drawn by tracing the logic of the connection between the archetype of kindness and modern compassion. The desire to defend human rights is an active embodiment of the regulatory influence of this set of humanistic meanings.

However, for all the humanistic orientation of this semantic field, it contains a meaning that somewhat balances its refinement, introducing an element of struggle. This is a stereotype of the "us – them" confrontation. Its presence in the mechanism of self-regulation of interactions ensures the operation of a socio-cultural "filter" equipped with the "insiders" and "outsiders" markers, i.e. a set of features that are attributed to one and the other. The evaluation criterion is "conscience", i.e. the judgment is "according to one's conscience", and on this basis there is a separation of "insiders" from "outsiders"; thus, one cannot count on the same manifestation of humanism to all. Previous studies have clearly shown that the border between "us" and "them" in Russian society, including the younger generation, runs along the line that separates the carriers of traditional attitudes (collectivism, compliance with norms, belonging to one nationality) from the carriers of modern ones (violation of norms, individualism, striving for enrichment, belonging to another nationality). Depending on these correlations, the issue related to showing compassion and recognizing rights is resolved, so the difference in the thesaurus leads to non-compliance with the requirement to respect the rights of like-minded people and opponents equally. This is especially evident in the political field of Russian reality.

Next, the layers of **Group A** were arranged as follows: Taxon 3 is located on the second level; Taxon 2 – on the third level; Taxon 1 – on the fourth level; Taxon 6 – on the fifth level. Let us consider what meanings were included in the general field.

Taxon 3, which has a high degree of manifestation, consists entirely of modern meanings. The core of Taxon 3 contains *moral anomie as a special type of culture* generated by the destruction of normativity; it also contains a *sense of being the chosen one and a sense of exclusivity* as the most important subcultural marker.

The semantic basis of moral anomie is, first, emancipation raised to the highest value and understood as liberation from any form of restriction, the right not to obey anyone and anything, while constructing one's own system of moral norms and at the same time not raising any of them to the rank of an imperative. Second, moral anomie is based on the assertion of the right to legitimize any otherness, and third, on the reinterpretation of deviation as a new normality.

Emancipation and moral anomie emerged in the wake of rapid liberalization; they established themselves in the middle generation and earned the status of a modern, but, rather, basic type of culture. The abandonment of deviation and the emergence of a new normality are products of modern times; therefore, they are mainly a youth phenomenon.

The feeling of being chosen, exclusivity – the second element from the core of the taxon – expands this meaning, and the *desire to be in the center of attention and shock others* concretizes the forms of implementation in social interactions.

Thus, **Taxon 3** was built entirely on modern meanings, one part of which is connected with the modern basic culture, and the other two parts are connected with modern youth culture.

Taxon 2, which is located further on, represents an organic semantic unity of two habitus – constancy and predictability – and the archetype of good. Moreover, the core of the taxon is formed by a practical meaning, and the extension – by an archetypal meaning. This semantic unity results from the basic orientation of young people toward stability, which has been of considerable importance since the late 1990s. This attitude was strengthened and consolidated under the impact of a difficult life experience of previous generations of young people, who lived through a series of economic, political, international, military and other crises. The habitus of constancy and predictability – the "thesaurus mechanism for stabilizing the sociodynamics of culture" [25] – is today perceived as a result of "practical reason" and as a compensatory mechanism that ensures stabilization of life situations at the individual, personal and group levels. This semantic field is formed in contrast to uncertainty, unpredictability and risk as an immanent component of reality in Russian society.

The meaning inherent in the habitus of constancy is expanded by the meaning contained in the archetype of good, and thereby receives political justification. It is not connected with any of the meanings that can be interpreted as conformity or loyalty to the regime, but is associated with an unconscious belief in good, which speaks in favor of this motivation as able to relieve tension in social interactions.

The next two lower layers of **Group A** represent **Taxon 1 and Taxon 6**. The core of Taxon 1 is a semantic unity formed by the spiritual type of culture and the archetype of idealization of the past.

Taxon 1 is represented mainly by the dominant of traditional meanings, supported by high moral aspirations for the highest meanings of good, love, honor, dignity, mercy and compassion, love for one's neighbor and for one's motherland, a respectful attitude toward the country's past and its history. The fact that most of these meanings represent archetypal and mental features gives them stability and corresponding intentionality.

Taxon 1 unites spiritual culture and the archetype of idealization of the past. Their interaction is generated by the type of spirituality that is not just covered by traditional attitude toward the country, respect for its culture, historical past and achievements, but is enshrined at the level of the collective unconscious. In such a semantic combination, spirituality itself is expressed through historical memory, which, in turn, forms the "moral climate" (D.S. Likhachev). If we understand spirituality as the highest level of self-regulation, at which the main motivational and semantic regulators of life activity are supra-individual values, then in combination with the archetype of idealization of the past, it can be a source of higher meanings of kindness, love, belonging and solidarity in the broader context of social interactions. On their basis, sources of consolidation of youth and society can emerge. The core of this taxon is enshrined in the following mental features: love for the motherland and one's neighbor, honor and dignity. Russian philosophy and literature consider these features as the reflection of the "Russian soul". The connection between these elements

and basic trust indicates that they act as its criteria. This conclusion is confirmed by previous studies, according to which the groups that show the very mental traits we have named and that constitute the core of Taxon 1 enjoy the greatest trust among young people

This semantic configuration is manifested in the relationship with the adaptive and hedonistic culture. The connection with the adaptive culture as a life in the mode of economy and saving can be explained by the vulnerability of young people in a purely pragmatic modern world. Being oriented toward spiritual values and slightly "vintage" against the background of modern cynicism, they are forced to adapt and survive. However, the presence of a connection with a hedonistic culture in the taxon gives this refined spiritual image a completely modern flow. It is the connection with the culture of pleasure and impressions that does not allow us to interpret this semantic field only as the realm of selflessness and asceticism. This symbiosis suggests that the minds of young people contain both traditional and modern attitudes, which are an integral part of the semantic space of reality. The combination of such features, which cannot be explained within the framework of a flat and stereotypical view of young people, should be considered as a manifestation of much more complex connections in the mechanism of self-regulation of life activity. The habitus of an active life position, located in this semantic field, also speaks in favor of this conclusion. As we can see, the highest spiritual values and trust are the basis for its implementation, which gives the activity a reflexive and socially significant character.

Taxon 6, which completes Group A, has at its core a culture of physical development, combined with the need for self-expression and the desire to be different from others. In the expansion of this taxon, there is an innovative type of culture, indicating that young people's development and self-expression occur through the development of new experiences and a craving for novelty. Taxon 6 clearly reflects characteristic features of the phenomenon of youth subculture.

From the point of view of interaction between the elements of the mechanism of socio-cultural self-regulation, **Group A** is a group that has *a complete set of habitus, one of the meaning-of-life values ("love"), a large archetypal complex* (five out of the eight archetypes), *the main mental traits* (love for the motherland, compassion, honor and dignity, love for one's neighbor), *typical semantic foundations of youth subculture* (self-expression, exclusivity, egocentrism and the desire to shock others), *a stereotype* that feeds the confrontation of "insiders" and "outsiders", and *basic trust*. A distinctive feature of this group consists in the fact that traditional spiritual meanings associated with archetypal and mental traits (the core of Group A (Taxon 4, Taxon 5) and Taxon 1) proved more pronounced than modern ones (Taxon 6).

The next group of taxa **(Group B)** has three layers. The core of the group (the first layer) consists of Taxon 7 and Taxon 8; Taxon 9 is located in the second layer, and Taxon 10 is located in the third one.

In the core of **Group B**, the collective unconscious and modern liberal motives in various forms, including anarchic countercultural protest, were combined into one semantic field. Thus, modern pragmatic ***attitude toward the country as a place of residence*** is combined here with an ***archetypal belief in the savior***, and the subcultural ***protest against officialism*** is driven by the modern idea of ***openness to everything foreign*** as a modern feature and the same subcultural desire for ***freedom without restrictions***.

Taxon 9 reflects a highly pragmatic combination of the modern feature of *rationalism* with the archetype of *guilt and obedience*. It is obvious that the manifestation of obedience expressed by loyalty and submission is the result of historical experience imprinted deeply in the structure of the collective

unconscious. It manifests itself at the level of the genetic program of self-preservation as a voluntary rejection of subjectivity, because "it's more trouble than it is worth". Thus, the semantic field of **Group B** creates the basis for passivity both as an unconscious attitude and as a conscious rational strategy.

The core of Taxon 10 in its core is a combination of the meaning-of-life value of a quiet, comfortable life with a subcultural orientation toward escapism, "retreat into oneself", expanded by one of the key meaning-of-life values of young people – the desire for self-realization. This combination of meanings indicates a high individualization at its basis. Retreat into oneself in this context means isolation aimed at solving individual life tasks, when any social participation is considered as a distraction from the main thing and an obstacle to self-realization. The position of isolation is reinforced by suspicion of everything foreign – manifestation of a mental trait. It emerges at the second level of this taxon.

Thus, in **Group B**, which consists of four taxa, the core of the semantic field determines the interaction of archetypal basic values and modern semantic attitudes; the interaction is supplemented and expanded by their connection with traditional mental and modern subcultural meanings. Pragmatism, but also trust; cosmopolitanism, but also caution, obedience and faith in the "patron", but also protest against officialdom, freedom without borders, orientation toward well-being and self-realization, but also retreat into oneself – this is a contradictory set of complementary semantic attitudes that reflect this part of young people's semantic space.

Group C, located at the next level, includes three taxa: **Taxon 11 and Taxon 12**, which constitute the core of **Group C**, and **Taxon 13**. The semantic field of this group is also ambiguous. At its core is the meaning-of-life value of striving for truth, which is understood as striving for a generalized ideal, combined with an archetypal belief in the rightness of power (the core of **Taxon 11**), supplemented by meaning-of-life values such as the continuation of oneself in one's children and the struggle for justice, as well as the consistent interaction of two habitual attitudes – prudence and risk (the core of **Taxon 12**), logically related to the habitus of changes.

The semantic fields that formed the core of the group under consideration indicate an extremely active passionate type of self-regulation: it is practical, ready for changes and risks, but at the same time quite loyal to the authorities, since it perceives their rightness at the level of the collective unconscious (that is, *a priori*). This combination of meanings is the most important stabilizing factor in the sphere of socio-political relations. It indicates the existence of a historically established model of relations, in which "mutual benefit leads both the ruler and the people to the same goal" [26, pp. 54–55]. However, it is important to note that in the youth environment, the archetype of the rightness of power itself is the weakest one in comparison with other archetypes, and it balances at the level of uncertainty with a weighted average coefficient slightly higher than four on a seven-point scale. Therefore, this shaky alliance can be broken if the achievement of meaning-of-life values in an alliance with a specific government is put in jeopardy.

Taxon 13 is based on distrust as a life attitude in combination with the habitus of a passive life position, which is supplemented by political struggle as a meaning-of-life value at the second level. Distrust and passivity is a fairly stable combination in youth environment, where distrust of others often plays a major role, and passivity becomes its derivative. The fact that a value such as political struggle is part of this semantic field indicates a high distrust of any political actions; this distrust is firmly set at the level of habitual attitudes. One's own passivity and habit of not trusting others is converted into suspicion of anyone who somehow participates in the political process and leads to devaluation of their efforts. This circumstance clarifies the attitude

of some part of Russians toward protest actions, in which the other part, on the contrary, participates quite actively. In this context, the suspicion of foreigners detected in a neighboring taxon has a similar meaning.

By its composition, **Group C** is a group of practical meaning based not only on pure experience and established patterns of habitual behavior, as evidenced by the combined habitus, but also meaning-of-life values. Most of the meaning-of-life values indicate the passionate intentionality of this semantic field. The attitude toward change and risk gives it dynamism, and their attitude toward power acts as a significant regulator.

Conclusions

Thus, the semantic space of young people's reality creates complex configurations of meanings that are far from being obvious. It becomes possible to identify them with the help of more sensitive methods and procedures, in particular, structural and taxonomic analysis. The applied method allows us to see which meanings are regulated by archetypes and mental traits, which meanings – by types of culture and meaning-of-life values, and in which cases habitus and stereotypes dominate.

According to our analysis, both types of semantic projections – traditional and modern – are simultaneously present in the structure of young people's semantic space. Patterns that are simultaneously associated with archetypal and mental structures, as well as with a new value-based order, acquire a practical embodiment of self-regulation of social interactions. This means that the combination of traditional and modern meanings is reflected in the value structure of young people and determines their ambiguous reactions to events and phenomena of social reality and influences their choice of specific forms of behavior. With such a combination, it is difficult to expect an unambiguous, predictable reaction of the younger generation to social processes; therefore, if we set the task of identifying more or less pronounced carriers of traditional and modern patterns in young people, then these patterns will rather be conditioned by specific situations in which one or another semantic dominant may manifest itself. In general, we have to state the presence of interaction between different cultural patterns in the cultural space, in the consciousness and models of self-regulation in the youth environment. This conclusion is of fundamental importance for choosing the mode of interaction with young people within the framework of the state youth policy and for understanding ways to reflect the expectations of young people in the state policy.

References

1. Between nature and culture. Chapter 4. The birth of meaning. 4.1. General remarks. *Sem' iskusstv=The Seven Arts*, 2011, no. 3 (16), March. Available at: https://7iskusstv.com/2011/Nomer3/Pelipenko1.php#_ftn1 (accessed: March 19, 2021) (in Russian).
2. Levanskii V.A. *Modelirovanie v sotsial'no-pravovykh issledovaniyakh* [Modeling in Socio-Legal Research]. Moscow, 1986.
3. Levanskii V.A., Lyubutov A.S. Political spectrum in Russia: Structural-taxonomic analysis (parties, factions, elections in 1993–1996). *Gosudarstvo i pravo=State and Law*, 1997, no. 9, pp. 87–94 (in Russian).
4. Lyubutov A.S. Changing orientations of young people in modern socio-political conditions: structural analysis. In: *Mat-ly Mezhdunar. nauch.-praktich. Konf. "Chelovek i obshchestvo: tendentsii sotsial'nykh izmenenii", Sankt-Peterburg – Minsk – Rostov-na-Donu, 24–26 sentyabrya 1997 g. Vyp. 2. Problemy molodezhi i obrazovaniya (v 2-kh chastyakh). Ch. 1. Molodezh' i obshchestvo* [Proceedings of an international research-to-practice conference "Man and society: Trends in social changes", Saint Petersburg–Minsk–Rostov-on-Don, September 24–26, 1997. Issue 2. Problems of youth and education (in 2 parts). Part 1. Youth and society]. Pp. 95–98 (in Russian).

5. Lubutov A.S. Sociolocation – new approach to analytical monitoring of social dynamics on the basis of projective structuring. In: *Proceedings of the International Conference "Mathematical Modeling of Social and Economic Dynamics" (MMSED-2007). 2007, June 20–22, Moscow, Russia*. Pp. 147–152 (in Russian).
6. Zubok Yu.A., Chuprov V.I., Lyubutov A.S. Self-organization in the self-regulation mechanism of life of young people. *Molodezh' i molodezhnaya politika: novye smysly i praktiki. Seriya "Demografiya. Sotsiologiya. Ekonomika"=Youth and Youth Policy and Practice. Series "Demography. Sociology. Economy"*, 2019, vol. 5, no. 1, pp. 15–35 (in Russian).
7. Zubok Yu.A., Chuprov V.I., Lyubutov A.S. An experience of structural and taxonomic research of self-organization in the life activity of the youth. *Vestnik Tomskogo Gosudarstvennogo universiteta. Seriya «Filosofiya. Sotsiologiya. Politologiya"=Tomsk State University Journal of Philosophy, Sociology and Political Science,* 2020, no. 53, pp. 59–75 (in Russian).
8. Chuprov V.I., Zubok Yu.A., Romanovich N.A. *Otnoshenie k real'nosti v rossiiskom obshchestve: sotsiokul'turnyi mekhanizm formirovaniya i vosproizvodstva* [Relation to reality in the Russian society: Socio-cultural mechanism of formation and reproduction]. Moscow: Norma, 2014.
9. Chuprov V.I. Self-regulation of the youth life in cultural space: the concept of socio-cultural mechanism. *Gumanitarii Yuga Rossii=Humanities of the South of Russia,* 2018, vol. 7, no. 4, pp. 14–19 (in Russian).
10. Zubok Yu.A., Chuprov V.I. Self-regulation of meaning-and-life values in the cultural space of youth. *Vestnik Instituta sotsiologii=Bulletin of the Institute of Sociology,* 2019, vol. 10, no. 4, pp. 164–186. DOI: 10.19181/vis.2019.31.4.614 (in Russian).
11. Gorshkov M.K. (Ed.). *Uchenye zapiski FNISTs RAN Vyp. 7. Samoregulyatsiya zhiznedeyatel'nosti molodezhi: issledovanie sotsiokul'turnogo mekhanizma* [Academic notes of the Federal Research Center of the Russian Academy of Sciences. Issue 7. Self-regulation of the life of young people: a study of the socio-cultural mechanism]. Moscow: FNISTs RAN, 2020. 48 p.
12. Zubok Yu.A., Chuprov V.I. *Molodezh' v kul'turnom prostranstve. Samoregulyatsiya zhiznedeyatel'nosti* [Youth in the cultural space. Self-regulation of life activity]. Moscow: Norma, 2020.
13. Sikevich Z.V., Krokinskaya O.K., Possel' Yu.A. *Sotsial'noe bessoznatel'noe: sotsiologicheskii i sotsial'no-psikhologicheskii aspekty* [Social unconscious: sociological and socio-psychological aspects]. Saint Petersburg: Piter, 2005. 267 p.
14. Tarshis E.Ya. *Mental'nost' cheloveka: podkhody k kontseptsii i postanovka zadach issledovaniya* [Human mentality: Approaches to the concept and formulation of research tasks]. Moscow, 1999. P. 15.
15. Golosovker Ya.E. *Izbrannoe. Logika mifa* [Selected works. The logic of the myth]. Moscow – Saint Petersburg: Tsentr gumanitarnykh initsiativ, 2010. Available at: https://litresp.ru/chitat/ru/G/golosovker-yakov-emmanuilovich/izbrannoe-logika-mifa (accessed: November 1, 2019).
16. Kurganova N.I. Sense field as a way of meaning functioning. *Vestnik TvGU. Seriya "Filologiya"=Tver State University Bulletin. Series "Philology",* 2014, no. 2, pp. 319–324 (in Russian).
17. Sorokin P.A. *Osnovnye printsipy tsivilizatsionnoi teorii i ee kritika. Sravnitel'noe izuchenie tsivilizatsii* [Basic principles of civilizational theory and its criticism. Comparative study of civilizations]. Moscow, 1998.
18. Sorokin P.A. *Chelovek. Tsivilizatsiya. Obshchestvo* [Man. Civilization. Society]. Translated from English. Moscow: Politizdat, 1992. 543 p.
19. Lur'e S.V. What does psychological anthropology study? In: *Psikhologicheskaya antropologiya: istoriya, sovremennoe sostoyanie, perspektivy* [Psychological anthropology: History, current state, prospects]. Moscow: Akademicheskii proekt, 2005.
20. Lukov V.A. Theories of youth in the light of thesaurus-based approach. In: *Tezaurusnyi analiz mirovoi kul'tury: sb. nauch. trudov. Vyp. 21* [Thesaurus analysis of world culture: Collection of scientific works. Issue 21]. Moscow: Izd-vo Mosk. gumanit. un-ta, 2011. Pp. 3–13 (in Russian).
21. Berger P., Lukman T. *Sotsial'noe konstruirovanie real'nosti: traktat po sotsiologii znaniya* [The Social Construction of Reality: A Treatise in the Sociology of Knowledge]. Translated from English. Moscow: Medium, 1995.

22. Inglehart R. *Kul'turnaya evolyutsiya: kak izmenyayutsya chelovecheskie motivatsii i kak eto menyaet mir* [Cultural Evolution: How Human Motivations Change and How It Changes the World]. Translated from English by S.L. Lopatina. Moscow: Mysl', 2018. 347 p.

23. Zubok Yu.A. Young people in a changing social reality: the problem of self-regulation of choice. In: *Chelovek pered vyborom v sovremennom mire: problemy, vozmozhnosti, resheniya: mat-ly Vseros. nauch. konf.* [Man in front of the choice in the modern world: problems, opportunities, solutions: Proceedings of an all-Russian research-to-practice conference.]. Moscow: In-t filosofii RAN, 2015. Pp. 173–189 (in Russian).

24. Lyubutov A.S. The method of structural taxonomy: research potential for analysis of social and spiritual processes. *Nauchnyi rezul'tat. Sotsiologiya i upravlenie=Research Result. Sociology and Management,* 2019, vol. 5, no. 4, pp. 58–79. DOI: 10/18413/2408-9338-2019-5-4-0-6 (in Russian).

25. Lukov V.A. *Kul'tura i sotsium: Filosofskie voprosy kul'turnoi sotsiodinamiki* [Culture and society: philosophical issues of cultural sociodynamics]. Moscow: Izd-vo Mosk. gumanit. un-ta, 2008.

26. Polevoi A.N. *Istoriya russkogo naroda* [History of the Russian people]. Moscow: Izdatel'skii dom "Veche", 2008. 544 p. Available at: https://bookshake.net/r/istoriya-russkogo-naroda-nikolay-alekseevich-polevoy (accessed: March 24, 2021).

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Migration of Rural Population of the Russian Far East at the Beginning of the 21st Century

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Abstract. Nearly a quarter of the population of the Far Eastern Federal District, which occupies 40.6% of Russia's area, lives in rural territories. It is obvious that rural population and its migration mobility have territorial differences in such a large region. The purpose of the study is to conduct a spatial and temporal analysis of dynamics and factors of migration processes in rural areas of the Far Eastern Federal District of the Russian Federation. The work is based on the analysis of official statistical data. Since structural characteristics of migration flows are likely to change because of using a new methodology for accounting internal migration since 2011, we consider the period from January 2012 to January 2020. The authors show that migration is crucial for the formation of rural population. At the beginning of 2020, there was an increase in the intensity of migration processes in the district's rural areas, but the population's migration decline remains. Most migrants from rural areas settle in the Far Eastern Federal District –

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often, in towns. The flow of migrants from the town to the village retains statistical significance but does not correspond to the territorial structure of the migration outflow of rural residents. Based on the ratio of migration and natural population decline (growth), the authors developed a classification of rural areas in the subjects of the Far Eastern Federal District for 2011 and 2019. We analyze the reasons for the arrival and departure of rural population. Most migrants arrive after a temporary absence and leave for personal and family reasons. The authors show the influence of the dynamics of migration processes on the development of rural areas and agriculture in the context of a shortage of labor resources and restrictions on international movements of labor immigrants using a case study of the border region.

Key words: rural population, rural area, migration, rural typology, migration components, migration coefficients, Far East.

Introduction

Modern rural areas are heterogeneous, and some territories may have their own peculiarities of economic and socio-cultural development. The Far Eastern Federal District of the Russian Federation (FEFD) is characterized by the differentiation of regions by economic, social, cultural, and other indicators, which is reflected in the characteristics of rural population and rural territory.

As of early 2020, nearly 25% of the total population of the FEFD lived in rural areas, which was about 6% of Russia's rural population. Migration processes in the Far East (FE) from 1991 to 2019 were studied in detail in the works of researchers, but the assessment was carried out without the division into urban and rural populations in most cases [1; 2; 3]. Often, the features of rural areas are explored within all-Russian studies. For example, rural migration and rural areas were analyzed in detail in the works of N.V. Zubarevich, A.I. Alekseev, S.G. Safronov, S.Ya. Suschego [4; 5; 6] within all-Russian and regional studies from the point of view of geodemographic dynamics of rural population and the transformation of rural settlement; distribution of labor resources in rural areas was presented in the work of T.G. Nefedova, N.V. Mkrtchyan [7]. The collective work [8] and the research by Jiayi Zhou [9], A. Hostman, etc. [10] are devoted to the influence of foreign labor migrants and investments on the development of rural areas. The typology of rural areas is presented by N.V. Zubarevich [4], D.O. Egorova, V.S. Shurupina [11], etc. In these works, as in most others, rural population and rural areas of the Far East were not distinguished as a separate research object. For the Far East, international labor migration has been a significant phenomenon over the past few decades. The study of migration flows from China to the Russian Far East is one of the most popular areas of scientific research among specialists considering migration in this region. This question was addressed not only by Russian, but also by foreign researchers [9; 12].

If we talk about current global trends in the study of rural areas and rural population, we can note an increase in attention to socio-economic factors (low standard of living among rural population, poverty, low availability of social services, high unemployment in rural areas), which are significant conditions for the departure of rural population to urban areas [13–16]. Significant pushing factors are the lack of land plots among rural residents or their insignificant area, low land fertility, expansion of agricultural land areas among large tenants [17; 18; 19]. The studies emphasize the important role of education in reducing the level of migration from rural to urban areas [20; 21; 22].

In current foreign empirical studies, much attention is paid to the study of return migration from a city to a village [23], which serves as an

opportunity for the development of rural areas. The main reasons and advantages of returning migrants to rural areas may relate to wider employment opportunities for young people, who have received an education [22], equalization of the standard of living between the city and the countryside, which reduces the attractiveness of living in the city [23]. In the current conditions and restrictions associated with the spread of the COVID-19 virus, the share of returning migrants from rural areas may increase. In China, the idea of the probability of return migration to rural areas and the need to use this opportunity to consolidate the rural population was voiced in the spring of 2020[1].

It should be noted that most studies on rural areas and rural population in the Russian Far East are local, affecting individual subjects or different time periods, which does not allow them to be compared to assess the whole situation in the FEFD. For example, the problem of reproduction of the personnel issue in agriculture was studied in the works of E.V. Koryakina, E.N. Tuzhilina, G.I. Dayanova, L.D. Protopopova, I.K. Egorova, etc. [24; 25]; N.P. Kuzmich explored the possibilities of increasing the role of socially-oriented areas of rural development in the Amur Region [26]; features of rural-urban migration in the Republic of Sakha (Yakutia) were shown by S.A. Sukneva, A.V. Trubina [27]; prospects for the development of entrepreneurship in rural areas of the Primorsky Krai were explored by E.G. Gusev and G.I. Shuman [28].

The purpose of our work is to conduct a spatial and temporal analysis of the dynamics of migration processes in rural areas of the Far Eastern Federal District of the Russian Federation and its subjects, as well as to assess the role of migration as an important component of changes in rural population. Considering a probability of transformation of structural characteristics of migration flows because of using the new methodology for accounting for internal migration, which has been active since 2011 [29], we analyze most statistical data for the period from January 2012 to January 2020.

Methods and research methodology

Considering the variety of approaches to the definition of population migration, the paper considers a part of the permanent migration of rural population, which is a set of territorial movements between a village and a city, a city and a village, a village and a village, accompanied by a change of residence for a relatively long period [30, p. 17]. This approach is explained by the usage of statistical data that do not allow taking into account seasonal migration, pendulum trips of population, travel, tourism. According to the demographic approach, migration not only affects changes in demographic development, but also reflects economic, political, geographical, and other aspects of the development of society. The first part of the study evaluates the change in the rural population by components, including natural and migration movement, as well as the role of migration and territorial transformations. The second part presents the results of the analysis of the migration movement of population in relation to irrevocable migration, based on the existing methodological apparatus used as part of the methodological approach to the study of migration processes [31, p. 281]. The analysis of the size and volume of migration flows, intensity of migration flows for the period from 2010 to 2019 was carried out, main directions of migration were identified, migration behavior was analyzed in the context of population migration factors. In addition, based on a comparative analysis of data obtained on the dynamics of natural and migration growth of rural population, a classification of the subjects of the FEFD according to the data for 2011 and 2019 is proposed.

[1] What is the reason for the "return" of migrant workers in 2020? Available at: https://k.sina.cn/article_1655703524_62b007e400100po0x.html (accessed: October 15, 2020).

The analysis of migration processes was carried out at the federal and regional levels. A detailed analysis of migration processes in rural areas at the local level is not presented in the article, but the work on collecting statistical data at the local level has revealed some methodological difficulties. In the database "Indicators of Municipalities", information is aggregated by municipal districts, municipal districts, urban districts, urban and rural settlements, inter-settlement territories, which corresponds to Federal Law no. 131-FZ "On general principles of the organization of local self-government in the Russian Federation", dated October 6, 2003 (as amended on May 1, 2019, no. 87-FZ). This division does not fully correspond to the assessment of the flows of rural and urban population, because, as a result of changes taking place in the administrative-territorial system, part of rural population does not live in rural settlements, and it is invisible for the analysis of the migration of rural population. The percentage of unaccounted rural residents varies by region. While comparing statistical data on a number of rural residents in the FEFD[2] and a number of people living in rural settlements[3], it turned out that, at the beginning of 2020, a number of rural population in the district was 14.1% higher than a number of people living in rural settlements. For individual subjects, this ratio reaches 100% (Sakhalin and Magadan regions), 36.7% in Primorsky Krai, 35.2% in Chukotka AO, 13.1% in Jewish AO. Such differences in indicators distort information about the settlement of rural population since this part of rural population is located outside rural settlements. In addition, when analyzing migration flows of rural population (intraregional, interregional, international) within the administrative-territorial units, movements of the specified share of the rural population will not be considered.

We use a systematic approach, a generalization method, a cartographic method, an analysis of statistical, literary, and empirical data on the dynamics of migration processes in rural areas of the Russian Far East.

Research results

General characteristics of rural population of the Far Eastern Federal District

The share of rural population in the FEFD is about a quarter of total population of the district. As a result of the inclusion of two subjects into the Far Eastern Federal District in November 2018 – Republic of Buryatia and Zabaykalsky Krai – this indicator increased by 2.87 p.p. At the beginning of 2020, rural population of the FEFD was 5.9% of the total rural population in Russia.

Dynamics of changes in the characteristics of rural population of the FEFD, in comparison with other districts of the Russian Federation for the period from 2011 to 2020, does not differ from a general situation. The analysis of data on nine subjects of the FEFD at the beginning of 2018 and eleven subjects at the beginning of 2020 indicates the preservation of the seventh rank of the FEFD according to the indicator "average age of rural population". In absolute terms, growth for this indicator was 0.09 years.

As of early 2020, the FEFD ranked 4th in terms of the share of rural population among the total population. Absolute values of this indicator for the district increased from 24.25 to 27.1% from 2018 to 2020.

The number of residents of disabled age per 1000 residents of working age has changed significantly. In early 2011, the FEFD occupied the last (8th) place among federal districts by this indicator, then, at the beginning of 2018, it was at the 7th position. In early 2020, with 11 constituent entities, the FEFD ranked 5th among

[2] Source: *Number and Migration of the RF Population*. Available at: https://www.gks.ru/compendium/document/13283

[3] Source: *Population of the Russian Federation by Municipality*. Available at: https://rosstat.gov.ru/compendium/document/13282\

Table 1. Ranking of federal districts of the Russian Federation by indicators of rural development at the beginning of 2012, 2018, and 2020

Indicator	Year	RF	CFD	NWFD	SouFD	NCFD	VFD	UFD	SFD	FEFD
Share of rural population in the total population of the region, %	2012	26,1	18,4	16,3	37,5	50,8	28,9	19,8	27,8	25,1
	rank		7	8	2	1	3	6	4	5
	2018	25,6	17,8	15,6	37,4	50,2	28,1	18,6	26,9	24,2
	rank		7	8	2	1	3	6	4	5
	2020	25,3	17,7	15,1	37,2	49,7	27,8	18,4	25,7	27,1
	rank		7	8	2	1	3	6	5	4
Average age of population, years	2012	38,96	42,21	41,08	39,32	32,65	40,27	38,70	37,87	36,23
	rank		1	2	4	8	3	5	6	7
	2018	39,92	42,98	42,1	40,37	33,77	41,45	39,54	38,61	37,39
	rank		1	2	4	8	3	5	6	7
	2020	40,41	43,38	42,48	40,89	34,35	42,05	40,02	39,45	37,48
	rank		1	2	4	8	3	5	6	7
Number of non-working people per 1 thousand residents of working age, people.	2012	713	731	693	708	685	725	719	726	655
	rank		1	6	5	7	3	4	2	8
	2018	864	859	869	846	768	886	927	932	830
	rank		5	4	6	8	3	2	1	7
	2020	846	835	849	828	751	876	913	921	836
	rank		6	4	7	8	3	2	1	5
Women per 100 men, people	2012	1090	1133	1076	1103	1079	1087	1085	1076	990
	rank		1	6	2	5	3	4	6	7
	2018	1073	1108	1054	1099	1067	1061	1069	1060	984
	rank		1	7	2	4	5	3	6	8
	2020	1068	1099	1046	1095	1063	1054	1064	1063	991
	rank		1	6	2	4	5	3	4	7

Note: the higher the value of the indicator, the higher the rank is.
Complied according to: *Number and Migration of the RF Population*. Available at: https://www.gks.ru/compendium/document/13283

federal districts, which shows an increase in the demographic burden on its working-age population *(Tab. 1)*.

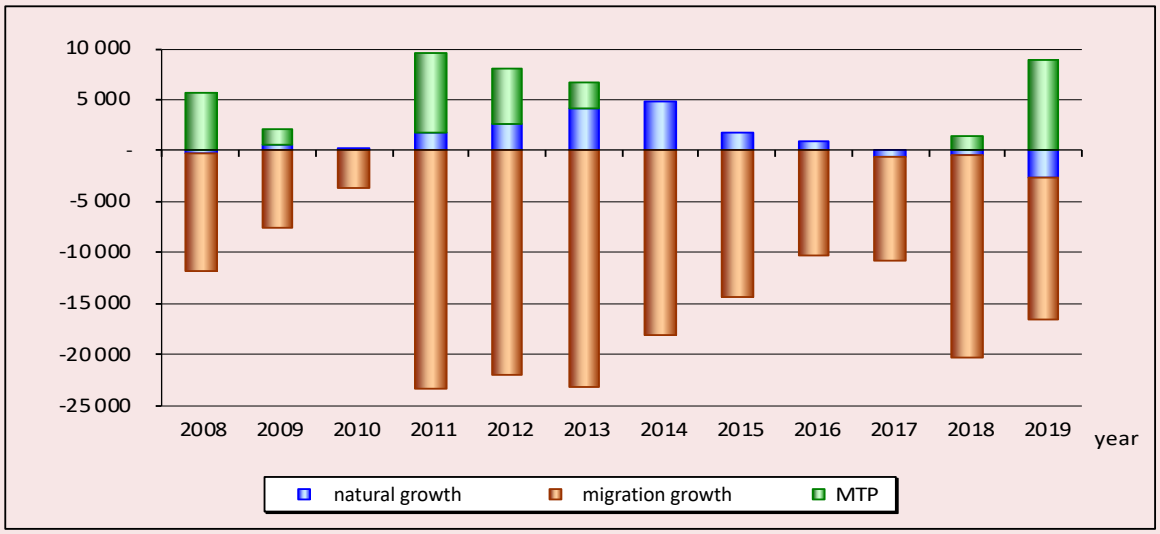
Inclusion of the Republic of Buryatia and Zabaykalsky Krai into the FEFD ensured an increase in the district's rural population by nearly 740 thousand people at the beginning of 2019, urban population – by 1310 thousand people. However, in the early 2020, the population has decreased.

In the context of the FEFD subjects in the early 2020, as of at the beginning of 2012, a maximum number of rural residents lived in Primorsky Krai (19.4% of the total number of rural residents in the FEFD). The second place was previously occupied by the Republic of Sakha (Yakutia), but, after 2018, the second place was taken by the Republic of Buryatia (18.2% of rural residents from the indicators for the FEFD in the early 2020). In five FEFD subjects in 2019, the share of the rural population in the total population of the region exceeded 30% (Republic of Sakha (Yakutia), Amur Oblast, Jewish AO, Republic of Buryatia, and Zabaykalsky Krai). The Republic of Buryatia is the leader according to the number of rural residents per 1000 citizens and the share of rural residents (40.8%). A minimum share of rural population in a region's total population was noted in the Magadan Oblast (3.93% in 2019).

Components of rural population change

Three components are considered in the formation of rural population: migration processes, natural movement of population, and municipal-territorial transformations (MTP).

Figure 1. Components of change of a number of permanent rural population of the FEFD for 2008–2019, people



Complied according to: *Number and Migration of the RF Population*. Available at: https://www.gks.ru/compendium/document/13283

The change of a number of rural population depends on the dynamics of population's natural movement to a lesser extent than the urban one *(Fig. 1)*.

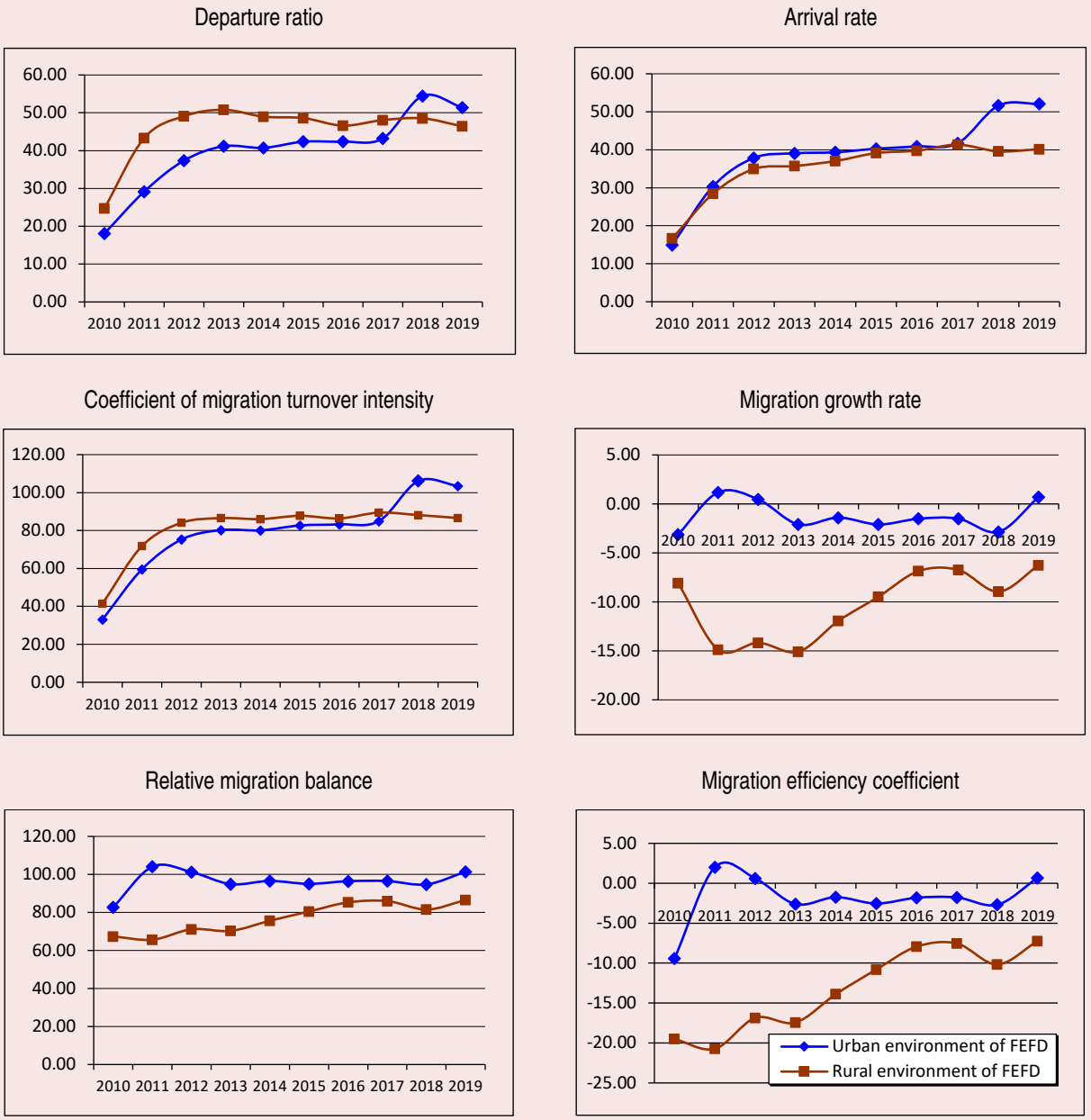
Natural growth does not compensate for negative values of migration processes. For the period from 2008 to 2019, total natural increase in the rural population of the Far East amounted to 12.8 thousand people, while the migration decline was 178 thousand people. In some years, an increase in the number of rural population is recorded within the framework of the MTP.

The analysis of migration in the FEFD is complicated by changes in the statistical accounting of migrants in 2011 and the expansion of the territorial borders of the district, which occurred in November 2018. Changes in the statistical accounting of migration led to a more significant increase in indicators in urban areas in 2011 compared to 2010. Territorial changes affected the indicators of rural areas *(Fig. 2)*.

Considering the directions of migration, we note that, in the context of federal districts, the main flow of migrants is concentrated within the Far East itself. 86% of rural migrants move within the FEFD, and only 14% leave the district. In 2019, about 28% of rural areas moved to a similar type of settlement. The share of migrants departuring and arriving in rural areas in 2019 was 8.9% of the total number of migrants in the district, or 28% of the number of migrants leaving rural areas.

Almost three quarters of migrants from rural areas leave for cities of the FEFD. At the same time, there is a reverse flow of migrants from the urban area of the district to the rural area, which compensated for the migration outflow of rural residents in 2019 by 88.8%. It should be noted that these indicators may not indicate the absence of problems of rural population "washing". Probably, migrants from urban areas move to the suburbs that have the status of rural areas, where the infrastructure and quality of life are inferior to the urban level, but much better than in the rural hinterland. In addition, services and tariffs in rural areas are lower than urban ones, which motivates population to move from cities to rural suburbs.

Figure 2. Migration coefficients in rural and urban areas of the FEFD, 2010–2019, per 1,000 people



Complied according to: *Number and Migration of the RF Population.* Available at: https://www.gks.ru/compendium/document/13283

The second direction of migration from rural areas of the FEFD is the Siberian Federal District, whose share in 2019 was 4.4% (4.6% in 2013) of the number of Far Eastern rural migrants who left for rural areas. The third and fourth places are occupied by the Southern and Central Federal Districts (3.3 and 2.2%). The share of other federal districts is insignificant.

Thus, despite the increase in the flow of migrants from rural areas, most of them currently settle in the subjects of the FEFD – in urban areas mainly. The flow of migrants from a city to a

Table 2. Volume of municipal-territorial transformations in rural areas of the Far East, people

	2008	2009	2012	2013	2018	2019	Total, 2008–2019
FEFD	5683	1478	5436	2451	1359	8933	25340
Primorsky Krai	-	-	-	60	-	2820	2880
Amur Oblast	861	1478	791	1400	-	-	4530
Magadan Oblast	-	-	-	991	-	268	1259
Khabarovsk Krai	-	-	2551	-	1359	-	3910
Kamchatka Krai	4167	-	2094	-	-	-	6261
Republic of Sakha (Yakutia)	655	-	-	-	-	-	655
Republic of Buryatia*	1453	-15353	-	4189	-	-	0**
Zabaykalsky Krai*	1067	-	-	-	-	5845	5845**

Note. The table includes FE subjects and years, where and when MTT happened in the studied period.
* Subject was not a part of the FEFD until 2017.
** Total for 2018–2019 – during the period of joining the FEFD.
Complied according to: *Number and Migration of the RF Population*. Available at: https://www.gks.ru/compendium/document/13283

village retains its statistical significance but does not correspond to the territorial structure of rural residents' migration outflow.

In 2019, positive values of most coefficients were largely explained not by the improvement of the migration situation, but by indicators of municipal and territorial transformations, the volume of which amounted to nearly 9 thousand people. In some years, the MTT had a significant impact on the dynamics of rural population. In the period from 2008 to 2019 in the Far East (considering data for two new subjects in 2018 and 2019), the growth of rural population due to the MTT amounted to 25.3 thousand people.

In regional terms, from 2008 to 2019, most MTT have occurred in the Amur Oblast (2008, 2009, 2012, 2013), however, a maximum increase in a number of rural residents at the expense of MTT was observed in Kamchatka Krai (+6261 people) *(Tab. 2)*.

In 2019, Zabaykalsky Krai was the only region with a total increase in rural population (+624), MTT provided an increase in rural population by 5,845 people, which exceeded natural and migration decline of population by 12%. In Primorsky Krai and the Magadan Oblast, the volume of MTT did not compensate for the natural and migration decline of the population, a number of rural population in these regions decreased.

Intensity of migration processes

The analysis of relative migration indicators in rural areas by the subjects of the FEFD from 2011 to 2019 indicates a positive trend. The intensity of migration turnover in rural areas in 2019, compared to 2011, increased in all subjects of the FEFD, except for Jewish AO (JAO). In Chukotka AO, the highest growth of the indicator was noted during the studied period (by 2.5 times). In 2019, a maximum value of the intensity coefficient of migration turnover was recorded in the Magadan Oblast, a minimum value – in Zabaykalsky Krai.

The growth of the intensity indicator of migration turnover is associated with the positive dynamics of the values of the arrival and departure coefficients *(Tab. 3)*. In all subjects of the FEFD in 2019, there was an increase in the value of the arrival coefficient, compared to the level of 2011. A maximum growth rate of the coefficient was recorded in Chukotka AO (3.6 times). Minimum arrival values were registered in Khabarovsk Krai (the growth rate is 11.6%). The growth rate of the departure values is lower than arrival indicators, which indicates a stabilization of the situation and a decrease in the number of people leaving the region. A decrease in the departure value in 2019 to the level of 2011 was recorded in four subjects (JAO, Amur and Sakhalin oblasts, Zabaykalsky Krai). The highest rates of departure growth are

Table 3. Indicators of migration in rural areas by subjects of FEFD, 2011, 2019

Indicator	Year	Rep. Sakha (Yakutia)	Kamchatka Krai	Primorsky Krai	Khabarovsk Krai	Amur Obl.	Magadan Obl.	Skhalin Obl.	JAO	CAO	Republic of Buryatia	Zabaykalsky Krai
DC	2011	39.4	33.1	44.9	43.4	43.3	93.0	53.2	46.9	35.4	42.5	38.8
	2019	41.3	50.4	51.7	52.4	41.0	107.3	48.0	31.5	63.4	51.9	37.4
	growth rates	**4.8**	**52.4**	**15.1**	**20.7**	**-5.3**	**15.4**	**-9.8**	**-32.8**	**79.1**	**22.0**	**-3.7**
AC	2011	14.9	27.0	30.9	41.0	31.1	34.2	28.9	27.8	11.0	28.7	17.8
	2019	33.9	46.2	47.9	45.8	35.6	61.5	43.2	30.1	51.3	49.3	23.6
	growth rates	**128.2**	**71.1**	**55.2**	**11.6**	**14.4**	**80.1**	**49.4**	**8.4**	**364.5**	**71.6**	**32.5**
MG	2011	-24.6	-6.1	-14.0	-2.4	-12.2	-58.8	-24.3	-19.1	-24.3	-13.8	-21.0
	2019	-7.4	-4.2	-3.7	-6.6	-5.4	-45.8	-4.8	-1.4	-12.1	-2.6	-13.8
	growth rates	**69.9**	**30.9**	**73.4**	**-179.1**	**55.7**	**22.2**	**80.2**	**92.8**	**50.3**	**81.1**	**34.4**

Complied according to: *Number and Migration of the RF Population*. Available at: https://www.gks.ru/compendium/document/13283
Population of the Russian Federation by Municipality. Available at: https://rosstat.gov.ru/compendium/document/13282

typical for Chukotka AO and Kamchatka Krai (79.1 and 52.4, respectively). The migration increase in all subjects of the district retains negative values. Based on the indicators of migration growth coefficients in rural areas in 2011 and 2019, all subjects of the FEFD were divided into three groups: with a high, medium, and low level of migration growth coefficient. Considering the preservation of negative coefficient values, we would like to note that the closer the value to zero, the better the situation is (the first type of regions with a high coefficient value), and vice versa – the greater the negative coefficient value, the lower the level of migration growth in the region is (the third type of regions with a low coefficient value). The second type is characterized by an average value of the coefficient. In 2011 and 2019, the Magadan Oblast was characterized by a low migration increase, having maximum negative values of the coefficient. The second group with the average values of the migration growth coefficient in 2011 included the Republic of Sakha (Yakutia), the Sakhalin Oblast and the Chukotka AO. In 2019, these three regions moved to the group with a high coefficient value. Thus, in 2019, only the Magadan Oblast was included in the group with a low coefficient value, having not changed its position since 2011, the remaining 10 subjects of the FEFD were in the group with a high coefficient value, that is, the migration situation was improving.

Classification of the subjects of the FEFD according to the dynamics of natural and migration growth in rural areas

According to the model of J. Webb [32], based on the ratio of natural and migration growth (loss) of population, 8 types of regions can be distinguished. As a result of the application of this classification for rural areas of the FEFD in 2011 and 2019, three types were identified. In 2011, two types of regions were identified: type 1, where the migration loss is higher than the natural increase, and type 2, where the migration loss is higher than the natural loss.

In 2019, the third type was determined, in which the value of the migration loss is lower than the indicator of the natural population loss that is associated, on the one hand, with a significant reduction in the migration loss of the population and, on the other, with the preservation or slight deterioration of natural loss indicators.

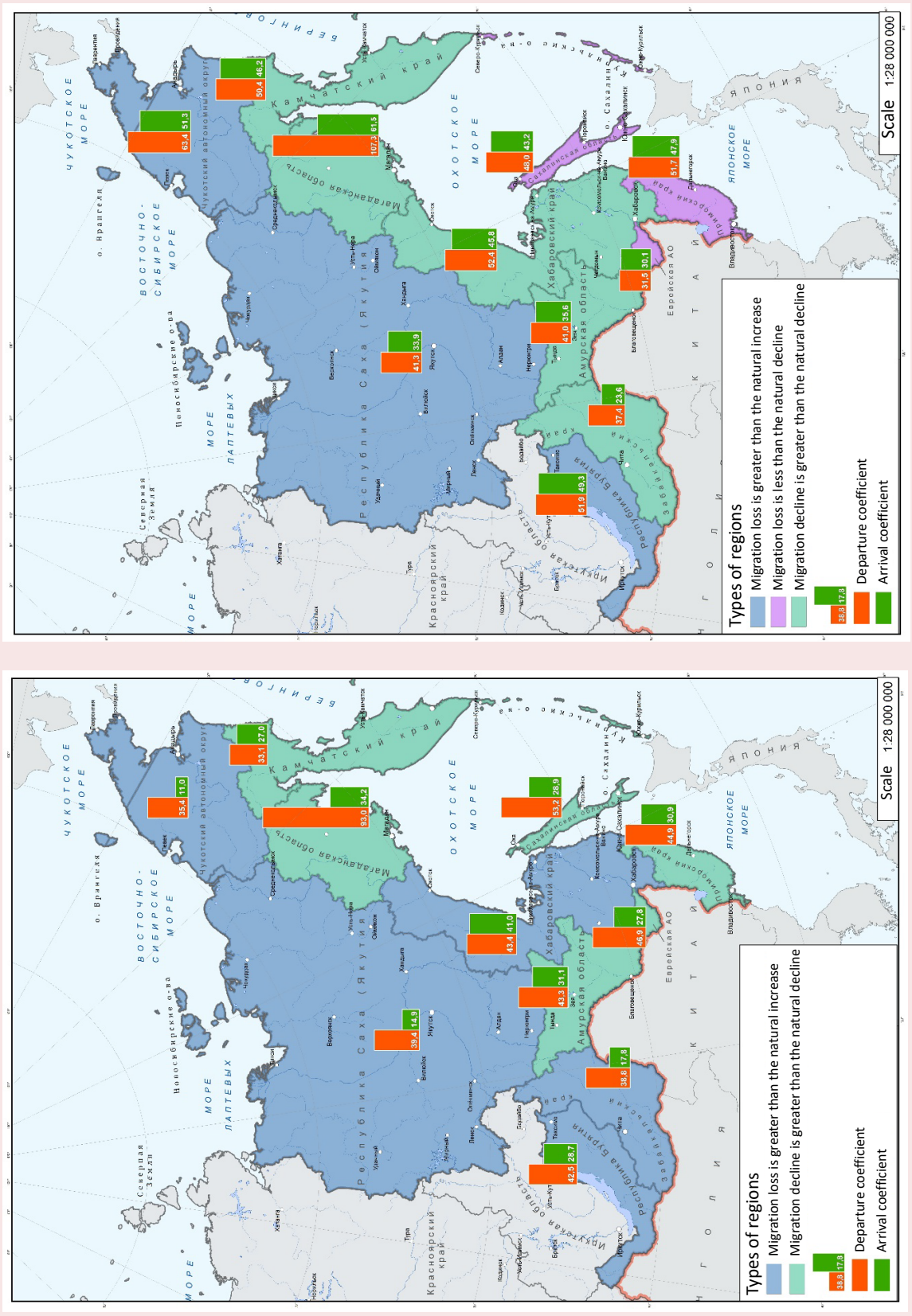


Figure 3. Classification of the FEFD subjects according to the migration and natural dynamics of rural population, 2011 and 2019

The designated types were named (Yakut, Magadan, Sakhalin) based on the prevalence of the designated processes in certain regions of the Far East. A typical region of the first type is the Republic of Sakha (Yakutia) with still a positive natural population growth with negative migration values. By 2019, the number of regions of this type had decreased due to the formation of a natural population decline in them. It is designated as "Yakut".

The second type of subjects ("Magadan") is characterized by an excess of the migration loss of population over the natural loss. The Magadan Oblast is a striking example of this type since high values of migration loss of the population remained there during the studied decade.

The third type ("Sakhalin") was formed because of a decrease in the migration loss of population while maintaining stable values of natural loss. This type of region is also characterized by a "double" population decline, including migration and natural processes, while the main reason for the population decline is natural decline. This ratio of indicators was more often observed in the Sakhalin Oblast. The classification of the subjects of the FEFD according to the dynamics of demographic indicators in 2011 and 2019 is shown in *figure 3*.

Thus, in some regions of the FEFD, the migration decline of population is drying up while the natural decline remains. Let us emphasize that we are talking about rural areas, where the birth rate has traditionally been high. For example, in 1990, 18.7 births per 1000 rural residents and 14.4 births per 1000 urban residents were registered in the regions of the Far East as a whole. This indicator decreased to 11.9 and 9.8, respectively, in 2019. The decrease in the number of births in rural areas was 36.4%, in urban areas – 25%.

Migration reasons

As we noted earlier, the main share of rural migrants moves within the framework of the FE. Based on the statistical approach, the paper analyzes the motives of migration of the Far East rural population in 2019.

Attention is drawn to a high share of population with the reason "return after temporary absence". It should be recalled that, since 2011, statistical accounting for long-term migration of the population includes people registered at the place of stay for a period of 9 months or more, as well as people removed from the registration at the place of stay due to the end of their stay period. In this case, the registration account removal is carried out automatically. It is not possible to determine true causes of population migration with the indication "return after temporary absence" and classify them by economic, social, and other factors.

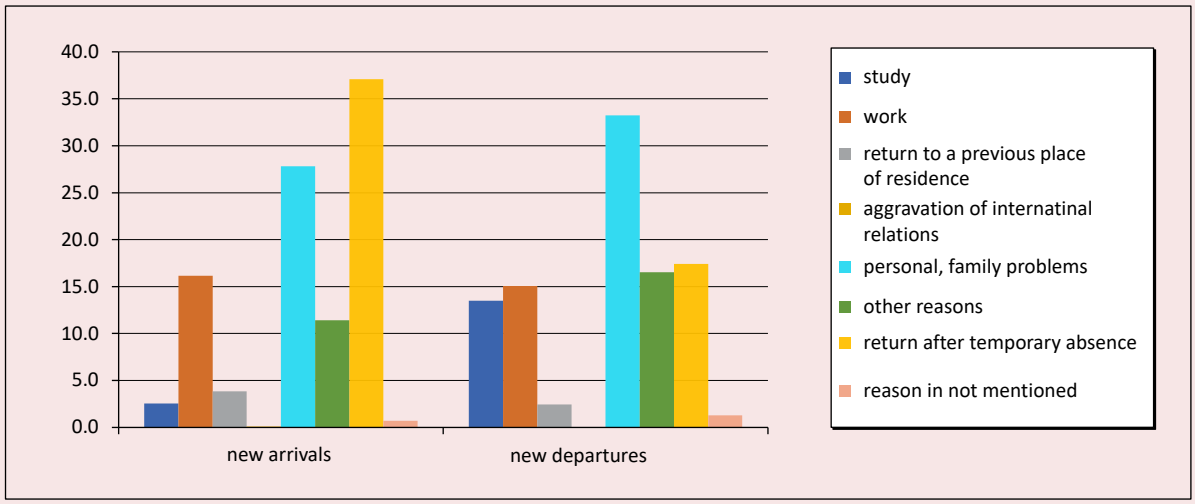
In general, for the Far East in 2019, 17% of retired rural population are automatically accounted for due to "return after temporary absence", 37% – among newly arrived rural population. Considering that the probability of the very fact of migration of the population due to this cause is low, it can be assumed that the flow of migrants arriving in rural areas is lower than the values indicated in official statistical sources.

Among other migration reasons of the rural population, the share of people who changed their place of residence due to study, work, and personal reasons is significant.

Significance of these reasons in the flows of incoming and outgoing migrants is not identical *(Fig. 4)*. Migrants leave (in descending order) for personal and family reasons, due to return after temporary absence, other reasons (most often, these are reasons for purchasing housing) and due to work. Nearly 80% of migrants who leave due to return after a temporary absence move within Russia. Among the foreign countries where migrants go, there are Uzbekistan (15.6%), Ukraine (15%), Armenia and Tajikistan (12.4% each), Kyrgyzstan (11.1%).

In the context of the Far East regions, the highest values of the share of departing migrants due to return after temporary absence (more than 30% of a total number of migrants who indicated the reasons) are recorded in the Kamchatka Krai and

Figure 4. Distribution of migrants in rural areas of FEFD according to the circumstances that caused the change of residence, 2019, %



Compiled according to: Rosstat data.

the Sakhalin Oblast. In addition, the Kamchatka Krai is the only region where the share of this category of migrants from Russia is below 50% of a total number of migrants, international migrants accounted for 54.4%, including ones from the CIS countries – 97.8%. The countries of departure are Armenia (34% of a total number of migrants from the CIS), Kyrgyzstan (31%), and Uzbekistan (13%). It should be recorded that Kamchatka Krai differs from other Far Eastern regions by a high proportion of international migrants from the CIS countries. In the Sakhalin Oblast, the share of internal Russian migrants returning after a temporary absence was 76.1%, 25% left for Ukraine as part of international migration, and 18.4% went to Tajikistan.

The maximum share of migrants who have left due to work is registered in Chukotka AO and Kamchatka Krai (100% within Russia).

Among the migrants who arrived in the rural area of the FEFD, a primary reason is "automatic registration of migrants" among those who returned after a temporary absence. The second most-popular reason is personal or family causes. A territorial analysis of the flows of migrants who arrived "after a temporary absence" showed that more than 50% are intraregional migrations in 7 out of 11 subjects. Minimum values of intraregional migration were recorded in the JAO (29%), the share of migrants from the Khabarovsk Krai in it was 41%. This situation is explained by a high share of the region's population traveling to work in the neighboring Khabarovsk Krai.

Regarding a number of migrants who arrived due to work, the Sakhalin Oblast leads according to the share of international migrants (53.3%), which is explained by the involvement of a large number of specialists from abroad to work in oil and gas industries. In other subjects of the district, the share of international migrants is significantly lower than 50%, it reaches its maximum value in Chukotka AO (5.1%).

Minimum values of intraregional movements of Russian citizens in relation to work were noted in Chukotka AO (15%), which reflects a predominant number of labor migrants arriving from other regions of Russia. A similar situation has developed in the Sakhalin Oblast, Kamchatka Krai, and Magadan Oblast (28, 28, and 34% of intraregional

migrants). Attention is drawn to high values of intraregional migration in relation to work in the Republic of Sakha (Yakutia) – 92%. This may be caused by differences in the level of economic development of the Republic's regions.

Discussion

As an important condition for solving managerial tasks to regulate (or attempt to regulate) migration activity of population, we can consider the presence of a more correct and accurate assessment of the causes of population's migration.

To understand the migration process, it is necessary to know what makes a person strive for resettlement and what are the necessary conditions for this [33, p. 102]. In our opinion, V.V. Onikienko and V.A. Popovkin's point of view, expressed in 1973, is still relevant: "Dissatisfaction with the rural way of life remains important in the migration of rural population: conditions of agricultural labor and isolation from achievements of modern civilization, which strengthens as a result of the expansion of means of communication" [34, p. 11].

Paraphrasing the thesis of T.I. Zaslavskaya and L.P. Lyashenko about the intentions of population to leave, we note that a decision to leave or stay in a settlement is closely "related to the opinion of people about what awaits them in the future (whether it would "develop", "stand still", or be "liquidated") [35, p. 45]. That is, the orientation to migration is not a "direct" response to external conditions, but it acts as a "subjective refraction of external factors in the direct experience of an individual" [30, p. 163].

In the second decade of the 21st century, the intensity of the population outflow from the Far East decreased, but it is likely that a number of settlements with a few inhabitants and their concentration in cities or in closely located territories will continue to decline [4]. Moreover, we can highlight the possibility of creating or restoring settlements that act as a place of residence for employees of projects implemented within the territories of advanced socio-economic development (TAD). As a result, the economic factor can have a positive impact on migration processes in rural areas. However, it is more likely that we can talk about the formation of an influx of labor migrants than permanent population.

At the same time, all-Russian trends, expressed in the direct relationship of the migration outflow with the sparseness of the territory's settlement [36], are likely to persist in rural areas of the FEFD.

Despite regional peculiarities, the reasons for migration from rural areas of the FEFD coincide with the reasons in the European regions of the country [37]. A low level and quality of life of population inferior to urban indicators, lack of infrastructure, limited opportunities for education and cultural development of population, employment opportunities with a corresponding income are the main migration factors [38; 39]. In sociological surveys, rural residents of the Republic of Buryatia mention low standard of living and social infrastructure, poor quality of educational and medical services, and a reduction in the production sector as the reasons for migration from rural areas. A similar situation is in Jewish AO [40].

Agreeing with V.I. Perevedentsev's point of view that a number of jobs largely determines a number of residents in a locality [31, p. 102], we assume that, for the Far Eastern regions of the Russian Federation, the implementation of measures of the "Strategy of sustainable development of rural territories of the Russian Federation until 2030", approved by the decree of the Government of the Russian Federation no. 151-r on February 2, 2015, gives hope for the consolidation of rural population and the development of rural areas. Improvement of the quality of life in rural areas of the FEFD subjects will probably reduce population's migration outflow. At the same time, the level of development of rural areas varies in individual regions.

In most Far Eastern regions, there was a reduction of villages in the post-Soviet period. Regional authorities are working to relocate residents from officially liquidated settlements.

Each region develops its own programs to address this issue. In addition, financial support is provided at the federal level. At the same time, the Republic of Sakha (Yakutia) is one of the few regions where villages have not been liquidated. It is working on their preservation. In 2021, within the framework of the "Movement of Good Deeds" program, 1 billion rubles are provided for the development of rural areas[4].

Another example of rural development reflects the result of the implementation of the "Far Eastern Hectare" program. In the Khabarovsk Krai, a new "Dalnevostochnoe" village has appeared on an area of about 200 hectares. It was formed because of the consolidation of compactly placed land plots provided under the program. The village is a part of an active rural settlement with an old school and without UCC: these issues are currently being discussed. It is obvious that, to secure residents in this rural settlement, it is necessary to improve the level of educational and medical services[5].

We assume that projects on the territories of advanced socio-economic development can have a positive impact on the development of rural areas. Since 2015, 20 TADs have been registered in the district's regions, within which projects in industry and agriculture, logistics, etc. have been announced. The projects are implemented in urban and rural areas. At the same time, it is necessary to consider the experience of the European regions of Russia, which has shown that the work of agricultural holdings in rural areas often leads to increased polarization, fragmentation of agriculture, and an increase in the outflow of local residents from economically disadvantaged areas [41]. Since the growth of indicators of socio-economic development of rural areas, because of the implementation of these projects in the FEFD, is not obvious, a promising direction in the study of rural areas of the macro-region will be to assess the impact of implemented projects on the indicators of rural areas and rural population.

Development of rural areas was largely related to the state of agriculture. The migration of rural population adjusts the nature of agricultural employment of the population in the FEFD. On the one hand, the same principles apply in the FEFD regions that are characteristic of the central agricultural regions: low wages remain, production is being modernized, and labor intensity in agriculture decreases [7]. On the other hand, in some Far Eastern regions, the practice of attracting international labor migrants to agriculture is widespread, which solves the problems of labor shortage and reduction of economic costs but can worsen the situation in rural areas [42]. In 2020, dependence of agriculture (rural areas) on the flows of international labor migration is noticeable. A striking example is Jewish AO, where the rural population continues to decline, due to migration loss too, but the acreage increases, and foreign investors are ready to finance their agricultural projects. In 2020, it was planned to attract about 1.3 thousand labor migrants from China for spring field work in the JAO. Due to the quarantine, quotas for attracting foreign labor were not in demand. A possibility of replacing foreign workers with local specialists can only be partially considered.

Conclusion

Within the framework of the demographic approach, it is shown that the rural area of the FEFD is heterogeneous, and it differs in the dynamics, prerequisites, and consequences of migration processes. Despite obvious regional differences, at the beginning of 2020, the migration decline of rural population remains in the district with increased intensity of migration processes.

[4] Prolonged relocation. *Rossiyskaya Gazeta – Ekonomika Dalnego Vostoka,* no. 35 (8386), dated February 18, 2021. Available at: https://rg.ru/2021/02/18/reg-dfo/kak-na-dalnem-vostoke-podhodiat-k-likvidacii-opustevshih-sel-i-dereven.html (accessed: April 10, 2021).

[5] In the Khabarovsk Krai, people are asking to build a school and a UCC for a village of "Far Eastern Hectare". March 11, 2021. Available at: https://www.finanz.ru/novosti/aktsii/v-khabarovskom-krae-dlya-sela-na-dalnevostochnykh-gektarakh-prosyat-postroit-shkolu-i-fap-1030171167 (accessed: April 10, 2021).

The study proposes and tests an approach to assessing the migration situation in the region's rural areas, considering absolute and relative migration indicators, which allows analyzing intra- and interregional changes.

The classification of the subjects of the Russian Federation in the FEFD is developed according to the model of J. Webb based on the indicators of demographic processes, considering natural and migration growth. The formation of the third type of regions in 2019, characterized by an excess of natural population loss over migration that was not observed in 2011, was recorded.

Unlike previous studies, the work with the dynamics from 2008 to 2019 considers the factor of municipal-territorial transformation when assessing the formation of the rural population in the Far Eastern regions of the Russian Federation.

The analysis of the motives for the arrival and departure of migrants in the context of the FEFD subjects reflects regional differences in migration processes, which is associated with the population's standard of living, specifics of the sectoral structure of the labor market, and geographical features of the studied territories.

The role of the administrative factor, changing the dynamics and directions of migration processes in rural areas within the implementation of regional and federal programs for the development of rural territories, is revealed.

As a result of the conducted research, the importance of considering the regional features of rural development in the subjects of the FEFD is shown. At the same time, it may be more effective to conduct comparative interregional studies that allow identifying common areas and differences of territories within the district. Complete information about the relationship between demographic, socio-economic characteristics, and objective data on the causes of population migration can be obtained by supplementing official statistical data with the results of questionnaire and expert surveys. At the same time, the regulation of migration should be a single process with the planning of the socio-economic development of the regions and regional differentiation of the conditions and the population's standard of living. Otherwise, there will be a discrepancy in the development plans of the regions and directions of migration flows.

References

1. Vashchuk A.S., Ermak G.G. The host community and labor migrants in the Russian Far East: An interdisciplinary analysis of the historical situation of the beginning of the 21st century. *Regional'nye problemy=Regional Problems*, 2016, vol. 19, no. 4, pp. 117–124 (in Russian).
2. Vorob'yova O.D. Labour market and migration in the Far East. *Uroven' zhizni naseleniya regionov Rossii=Living Standards and Quality of Life*, 2017, no. 2 (204), pp. 35–40. DOI: 10.12737/article_59007e9adba372.94662480 (in Russian).
3. Mishchuk S.N. General characteristics and regional differences of migration processes in the Russian Far East in the Post-Soviet period. *Reg. Res. Russ*, 2020, vol. 10, pp. 86–96. DOI: 10.1134/S2079970520010074
4. Zubarevich N.V. Transformation of rural settlement pattern and service network in rural areas. *Izvestiya RAN. Seriya geograficheskaya=Izvestiya Rossiiskoi Akademii Nauk. Seriya Geograficheskaya*, 2013, no. 3, pp. 26–38 (in Russian).
5. Alekseev A.I., Safronov S.G. Changes in rural settlement patterns in Russia during the late 20th – early 21st centuries. *Vestnik Moskovskogo universiteta. Ser. 5. Geografiya=Moscow University Bulletin. Series 5, Geography*, 2015, no. 2, pp. 66–76 (in Russian).
6. Sushchii S.Ya. Rural territories of the Volgograd region: Problems of demographic development (the last third of the XX – beginning of the XXI centuries). *Selo Rossii=Village of Russia*, 2019, no. 2, pp. 5–28. DOI: 10.22162/2658-5987-2019-2-5-28 (in Russian).

7. Nefedova T.G., Mkrtchyan N.V. Migration of rural population and dynamics of agricultural employment in the regions of Russia. *Vestnik Moskovskogo universiteta. Ser. 5: Geografiya=Moscow University Bulletin. Series 5, Geography*, 2017, no. 5, pp. 58–67 (in Russian).
8. Gudaj R.T., Yi F., Arefeva V.A., Yanbykh R.G., Mishchuk S.N., Potenko T.A., Zhou J., Zuenko I.Yu. Chinese farmers in the Russian Far East and local rural development. *The American Journal of Economics and Sociology*, 2020, vol. 79, iss. 5, pp. 1511–1551. DOI: 10.1111/ajes.12365
9. Jiayi Zhou Chinese agrarian capitalism in the Russian Far East. *Third World Thematics: A TWQ Journal*, 2016, vol. 1:5, pp. 612–632. DOI: 10.1080/23802014.2016.1327795
10. Horstmann A., Saxer M., Rippa A. *Routledge Handbook of Asian Borderlands,* 2018. 462 p.
11. Egorov D.O., Shurupina V.S. Rural settlement system of Russia: Typology of territories by rural settlements population. *Regional'nye issledovaniya=Regional Studies*, 2018, no. 4 (62), pp. 4–16 (in Russian).
12. Horie N. The positionality of Russia's Far East border regions. *Problems of Economic Transition*, 2017, vol. 59 (10), pp. 753–767. DOI: 10.1080/10611991.2017.1416835
13. Chukwuedozie K. Ajaero, Patience C. Onokala. The effects of rural-urban migration on rural communities of Southeastern Nigeria. *International Journal of Population Research*, vol. 2013. DOI: 10.1155/2013/610193
14. Wang C., Zhang Y., Yang Y., Yang Q., Hong J. What is driving the abandonment of villages in the mountains of Southeast China? *Land Degrad Dev*, 2019, vol. 30, pp. 1183–1192. DOI: 10.1002/ldr.3303
15. Sagynbekova L. Environment, rural livelihoods, and labor migration: A case study in Central Kyrgyzstan. *Mountain Research and Development*, 2017, vol. 37 (4), pp. 456–463. DOI: 10.1659/MRD-JOURNAL-D-17-00029.1
16. Akash Saha M.M., Adhikary S.K., Acharya Mishra G.C. *Migration in Agriculture the Realm and Reality.* Krishi Sanskriti Publications, 2019. 223 p.
17. Shaw R.P. Land tenure and the rural exodus in Latin America. *Economic Development and Cultural Change*, 1974, vol. 23 (1), pp. 123–132.
18. Siciliano G. Rural-urban migration and domestic land grabbing in China. *Popul. Space Place,* 2014, vol. 20, pp. 333–351. DOI: 10.1002/psp.1830
19. Xiao W., Zhao G. Agricultural land and rural-urban migration in China: A new pattern. *Land Use Policy*, 2018, vol. 74, pp. 142–150. DOI: 10.1016/j.landusepol.2017.05.013
20. Liu Z. Human capital externalities and rural–urban migration: Evidence from rural China. *China Economic Review*, 2008, vol. 19, pp. 521–535.
21. Bjarnason T., Edvardsson I.R. University pathways of urban and rural migration in Iceland. *Journal of Rural Studies*, 2017, vol. 54, pp. 244–254. DOI: 10.1016/j.jrurstud.2017.07.001
22. Buchenrieder G., Dufhues T., Möllers J., Runschke D., Sagyndykova G. Return to the countryside: The return intentions of highly educated young people in the Akmola province of Northern Kazakhstan. *Population, Space and Place*, 2020, vol. 26, iss. 2, pp. 1–14. DOI: 10.1002/psp.2273
23. Shuangshuang Tanga, Pu Haob. The return intentions of China's rural migrants: A study of Nanjing and Suzhou. *Journal of Urban Affairs*, 2019, vol. 41, no. 3, pp. 354–371. DOI: 10.1080/07352166.2017.1422981
24. Dayanova G.I. et al. Reproduction of labor resources in agriculture of the Republic of Sakha (Yakutia). *International Agricultural Journal*, 2020, vol. 63, no. 2, pp. 67–77. DOI: 10.24411/2588-0209-2020-10152 (in Russian).
25. Koryakina E.V., Tuzhilina E.N. The problem of rural cadres as the upgrading of the resource potential (for example, the south of the Far East in the years of Perestroika). *Vestnik Bryanskogo gosudarstvennogo universiteta=The Bryansk State University Herald*, 2017, no. 3, pp. 61–69 (in Russian).
26. Kuz'mich N.P. Construction in rural areas as a basis for enhancing the role of socially oriented areas of rural development in the Amur Region. *Vestnik KrasGAU=Bulletin of KrasGAU*, 2011, no. 5, pp. 3–7 (in Russian).
27. Sukneva S.A., Trubina A.V. The demographic component of formation juvenile potential of Republic Sakha (Yakutia). *Regional'naya ekonomika: teoriya i praktika=Regional Economics: Theory and Practice*, 2009, no. 32 (125), pp. 139–144 (in Russian).

28. Gusev E.G., Shuman G.I. Perspective directions of development entrepreneurship in rural areas of the Primorsky kray in the new economic conditions. *Fundamental'nye issledovaniya=Fundamental Research*, 2016, no. 11-2, pp. 378–386 (in Russian).
29. Korel' L.V. *Peremeshcheniya naseleniya mezhdu gorodom i selom v usloviyakh urbanizatsii* [Population Movements between Urban and Rural Areas in the Context of Urbanization]. Novosibirsk: Nauka, 1982. 191 p.
30. Dolbik-Vorobei T.A., Vorob'eva O.D. *Statistika naseleniya i demografiya* [Population Statistics and Demography]. Moscow: KNROUS, 2018. 314 p.
31. Perevedentsev V.I. *Metody izucheniya migratsii naseleniya* [Methods for Studying Population Migration]. Moscow: Nauka, 1975. 231 p.
32. Webb J. The natural and migration components of population changes in England and Wales, 1921–1931. *Economic Geography*, 1963, vol. 39, no. 2, pp. 130–148.
33. *Metodologicheskie voprosy izucheniya sotsial'nykh protsessov: sb. nauchn. Trudov* [Methodological Issues in the Study of Social Processes: Collection of Articles. scientific. Proceedings]. Ed. by RAS Academician A.G. Aganbegyan, AS USSR Corresponding member T.I. Zaslavskaya. Novosibirsk: IEiOPN SO AN SSSR, 1974. 301 p.
34. Onikienko V.V., Popovkin V.A. *Kompleksnoe issledovanie migratsionnykh protsessov. Analiz migratsii naseleniya USSR* [Comprehensive Study of Migration Processes. Analysis of the Population Migration of the Ukrainian SSR]. Moscow: Statistika, 1973. 159 p.
35. Ardalyanova A.Yu. et al. Modern Far Eastern border: Institutional transformations and center-peripheral processes. *Oikumena. Regionovedcheskie issledovaniya=Ojkumena. Regional Researches*, 2020, no. 3 (54), pp. 69–76. DOI: 10.24866/1998-6785/2020-3/69-76 (in Russian).
36. Mkrtchyan N.V. Problems in the statistics of internal Russian migration caused by changes in accounting methods in 2011. *Demograficheskoe obozrenie=Demographic Review*, 2020, vol. 7, no. 1, pp. 83–99 (in Russian).
37. Karachurina L.B., Mkrtchyan N.V. Role of migration in enhancing contrasts of settlement pattern at municipal level in Russia. *Izvestiya RAN. Seriya geograficheskaya=Izvestiya Rossiiskoi Akademii Nauk. Seriya Geograficheskaya*, 2016, no. 5, pp. 46–59. DOI: 10.15356/0373-2444-2016-5-46-59 (in Russian).
38. Nefedova T.G. Factors and trends of the structure of rural settlements in Russia. *Sotsial'no-ekonomicheskaya geografiya. Vestnik assotsiatsii rossiiskikh geografov-obshchestvovedov=Socio-Economic Geography. Bulletin of the Association of Russian Geographers and Social Scientists*, 2018, no. 7, pp. 1–12 (in Russian).
39. Kalinina I.V. Social infrastructure as a potential for rural development: From the past to the present. *Regional'nye problemy=Regional Problems*, 2020, vol. 23, no. 2, pp. 39–46. DOI: 10.31433/2618-9593-2020-23-2-39-46 (in Russian).
40. Gal'tseva N.V., Favstritskaya O.S., Sharypova O.A. Socio-economic factors of migration processes in the Magadan Oblast. *Regional'nye problemy=Regional Problems*, 2015, vol. 18, no. 3, pp. 23–34 (in Russian).
41. Nefedova T.G. Development of the Post-Soviet agricultural sector and rural spatial polarization in European Russia. *Prostranstvennaya ekonomika=Spatial Economics*, 2019, vol. 15, no. 4, pp. 36–56. DOI: 10.14530/se.2019.4.036-056 (in Russian).
42. Mishchuk S.N. Russian-Chinese Cooperation in Agriculture in the Far East of Russia. *Izvestiya Rossiiskoi akademii nauk. Seriya geograficheskaya=Izvestiya Rossiiskoi Akademii Nauk. Seriya Geograficheskaya*, 2016, no. 1, pp. 38–48. DOI: 10.15356/0373-2444-2016-1-38-48 (in Russian).

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Urban Environment as a Resource for Combining Professional and Parental Functions*

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Abstract. In the context of approving the "quality of life" concept, the formation of accessible and comfortable living environment is mentioned in Russia's national projects and in Russian towns' development programs. The purpose of the study is to analyze the quality of urban environment in terms of infrastructure conditions, located within walking distance, that minimize physical, material, and time costs of parents' forced daily mobility for educating and developing children. The scientific novelty of the study is related to the first-implemented approach to considering urban environment of residential neighborhoods as a resource for combining professional and parental functions. The empirical basis includes data of a mass survey of citizens-parents conducted in the megalopolis (Yekaterinburg) and the results of in-depth interviews with mothers of preschool and school-age children. The results of the study show a high subjective significance of territorial proximity of key child infrastructure facilities for successful combination of parental and professional functions. Moreover, it indicates a direct interconnection between the saturation of residing places with children's infrastructure facilities and overall satisfaction of parents with the quality of urban environment. The authors record the highest forced mobility due to the lack of walking distance services in the field of intellectual, creative, and sports development of children. A total number of deprived urban neighborhoods and the share of parents who are forced to use infrastructure services outside their neighborhoods indicate that there are spatial inequalities in access to urban goods. Practical significance of the study is the scientific justification of the need to develop comprehensive programs for the formation of a functionally rich environment in microlocal territories during the adoption of a progressive model for the development of a megapolis – "a network of 15-minute cities". The authors conclude that hyper-proximity-accessibility of urban services can be a significant resource (in a broader social policy for supporting families) for successful combination of parental and professional functions, ultimately contributing to improving the quality of life of citizens with children.

Key words: urban environment, parental and professional functions, family-friendly policies, child infrastructure, forced mobility, neighborhoods, pedestrian accessibility, 15-minute city model.

Introduction

A person must perform various social roles daily in current highly dynamic society. Each one requires certain resource costs – time, energy, effort, etc. Supporters of the life and work balance concept distinguish two main areas where a person realizes his/her roles. The first one is associated with an individual's professional activity, the second one – with everything outside it [1; 2]. This division is caused by the trend of active inclusion of women in the economy [3]. The resulting conflict ("work-family conflict") results from a lack of time to perform professional and family tasks, which can lead to an increase in a person's stress, worsening of mental and physical health [4–6].

Some aspects of this problem have been studied by several Russian scientists. For example, I.E. Kalabikhina and Zh.K. Shaikenova analyzed time transfers between members of Russian households, resulting in a conclusion about gender asymmetry and a greater contribution of women to the care economy [7]. V.D. Patrushev spent more than 30 years (1965–1998) studying the dynamics of time budgets in various categories of the population and the influence of income, social environment, work duration and intensity, education, and skill level factors on them [8]. Contemporary researchers, who record the trend of active combination of parental and professional functions (natural for,

first, megapolises), explain it by the phenomenon of intensive motherhood, which implies compliance with the requirements of "advanced" parenting and selecting more diverse and better child services, despite the difficulties associated with this choice [9; 10]. According to O.G. Isupova, "intensive motherhood in the school period of children's lives leads to constant mental stress and fatigue of mothers living in large towns of Russia" [11].

The increased need to address the issue of combining professional and parental functions has lead to several studies aimed at finding a balance between these two areas. Most often, scientists distinguish economic (payment of parental benefits) [12; 13] and organizational (provision of flexible working hours) [14; 15] measures to support working parents. However, working hours and poor financial incentives do not solve the problems faced by workers with children living in cities. A significant barrier to a successful combination of parental and professional functions is the conditions of the urban environment of life. The lack of children's infrastructure in the vicinity of their residential places creates obstacles for parents, who are forced to spend more physical, material, and time resources on everyday transit to accompany children to educational, cultural, leisure, and sports institutions. Territorial remoteness of daily demand key infrastructure objects, burdened by traditional complex transport problems of Russian cities, leads to negative consequences for the psychological state and physical health of parents who are constantly forced to experience the stress of "falling out of schedule" of performing professional and family duties. However, this aspect – influence of urban conditions on the success/failure of combining parental and professional functions – has not yet been studied in empirical research on various aspects of the quality of life of urban residents.

The current focus of contemporary foreign and domestic urban studies is largely focused on the analysis of comfort, humanity, environmental friendliness, and anthropo-orientation of urban environment [16–18]. In the general framework of provisions of a convenient, livable city, research on "friendliness" of the urban environment for various categories of the population is being carried out – for example, people with limited mobility [19; 20], children and adolescents [21; 22], parents with young children [23; 24], and elderly people [25; 26]. It is worth noting that researchers are more focused on identifying various kinds of physical barriers to access to urban goods and amenities. For example, the lack of technical facilities for disabled people and parents with strollers, slippery surfaces, high stairs and curbs, lack of handrails, handrails, sound traffic lights, smooth surface of sidewalks, ramps, safe streets for pedestrians with speed limiters on the roads, wide-opening doors in everyday institutions., well-equipped public spaces are the main obstacles to active social life and barrier-free urban mobility of people with disabilities or parents burdened with children's transit equipment. The hostility of the physical structure of urban environment for certain groups of citizens reinforces the practices of their social discrimination and spatial exclusion [19, p. 134], while the accessibility-barrier-free urban environment contributes to an increase in the level of living comfort and a variety of forms of social activity.

Currently, the importance of the concept of urban environment "comfort" is reflected in Russia's national projects[1] and in the largest Russian cities' strategic development plans. At the same time, it is necessary to understand that the improvement of urban environment should not be limited to formal "decoration" (installation of benches, bins, lighting, landscaping of courtyards, etc.) masking more serious problems, such as unbalanced infrastructural development of urban areas, increasing differentiation of districts in terms

[1] Federal project "Creating comfortable urban environment". Available at: https://национальныепроекты.рф/projects/zhile-i-gorodskaya-sreda/blagoustroystvo

of functional saturation, and the quality of local services, services. This problem has determined the focus of our research, which is focused on the analysis of environmental conditions in the micro-space section – at the level of urban neighborhoods.

Urban environment is a multi-layered phenomenon that provides opportunities for multi-variant research interpretations and aspects of its analysis from the point of view of various urban sciences – architecture and urban planning, cognitive urbanism, ecology, geography, sociology, etc. The theoretical framework of our research is the socio-ecological (V.L. Glazychev) and socio-anthropocentric (T.M. Dridze) conceptualization of urban environment. V.L. Glazychev, noting the semantic duality of the "environment" concept, characterizes urban environment as the relationship of the subject-spatial environment, conditions and behavior, interaction of people in these subject-spatial conditions. Various combinations of the "city-body" subject framework, socio-anthropogenic and natural landscape determine the specific "pattern" of urban environment, while a harmonious balance between them determines its quality [27]. Considering the methodology of social cognition developed by T.M. Dridze, urban environment is studied through the prism of the interaction of natural, "man-made" (results of technical and technological civilization), information and symbolic (streams of signs and symbols transmitted to communication networks connecting people with each other), socio-psycho-anthropological (other people with their mentality, image, and lifestyle) factors that make up the human life environment [28, p. 134–135]. In our opinion, both interpretations embody an interdisciplinary urban approach that allows us to explore urban environment as a complex of interrelated conditions and artifacts – natural and artificial, material and immaterial.

Urban environment in the totality of its constituent elements appears as an environment for the realization of various human needs – in physical development, health preservation, housing, security, education, work, communication, cultural development, entertainment, recreation, etc. Practical possibilities for the implementation of a wide range of needs and practices characterize a certain quality of urban environment. In the logic of our research, urban environment is considered a space of everyday practices among families with children in the projection of the conditions provided by a city to minimize physical, material, and time costs of forced mobility. These costs, in our opinion, are the main barrier to achieving a balance between different spheres of life – especially between professional and parental ones.

We analyze the quality of environmental conditions not from the point of view of formal fullness of residential places with children's infrastructure facilities in accordance with regulatory needs of providing population with necessary services, but from the point of view of real practices of using urban goods near places of residence, as well as the satisfaction of citizens with various components of urban environment and the range of services provided. Look at urban environment from the perspective of its primary subjects –residents – allows us to identify how objective living conditions correspond to citizens' real needs. Ultimately, a reliable assessment of the urban environment quality is determined not by the indicators of the commissioning of new infrastructure facilities, but by the "conversion" of achieved normative indicators into the quality of life and well-being of residents, considering their own perception and satisfaction.

The purpose of our research is to analyze the quality of urban environment of the Russian metropolis in terms of infrastructure conditions within walking distance, minimizing the physical, material, and time costs of forced daily mobility of parents for the education and development of children. The scientific novelty of the work is that we apply a new approach to studying urban environment (in the context of residential

neighborhoods) as a resource for people to combine professional and parental functions.

Data and methods

In October–November 2020, we conducted an empirical study of the quality and accessibility of urban environment at the level of microlocal territories (micro-districts) in one of the largest Russian megacities – Yekaterinburg.

At the first stage of the study, a survey of Yekaterinburg residents was conducted. Respondents were recruited with a streaming sample using a set of websites that provide representation of a wide range of population (the city administration website; the leading information portal of the city e1.ru; virtual communities in social networks dedicated to Yekaterinburg; thematic groups of city activists, etc.). Then a calibration adjustment was made using frequency alignment procedures – post-stratification based on gender, age, and residential area. From the final data set, 1,374 respondents were selected for analysis: parents with children of preschool and school age, 61.1% of which were women, and 38.9% – men. The median age of the parents surveyed was 34 years.

At this stage of the study, the following tasks were set that predetermined the logic of data analysis:

1) identification of overall satisfaction with the quality of urban environment in a place of residence (vital components of urban environment, social, consumer, recreational, child, transport infrastructure, aesthetics of urban environment);

2) assessment of scarce goods/services of pedestrian accessibility;

3) determination of forced mobility of parents associated with insufficient equipment of residential neighborhoods with child infrastructure facilities (schools, kindergartens, clubs and development centers, sports clubs);

4) identification of deprived neighborhoods based on the saturation of child infrastructure facilities;

5) assessment of the impact of the equipment of micro-districts with child infrastructure facilities on the overall satisfaction with the quality of urban environment.

Data processing and analysis were performed in SPSS 23.0. Statistical procedures were used for descriptive statistics, frequency analysis, and evaluation of the statistical significance of differences using the Mann–Whitney test.

At the second stage of the study, in-depth interviews with working mothers, aged 18–45 years (N = 9), were conducted. Mothers with children of junior, middle, senior preschool, and primary school age were selected, since this age interval corresponds to the most intensive stage of parental work. The interview guide included three main topics for discussion: professional and parental responsibilities of a respondent (types of activities, organization of work, intensity of work, etc.); barriers that prevent optimal combination of two employment types; necessary measures to support workers with children. When analyzing the results, special attention was paid to identifying subjective significance of the territorial proximity of child institutions and infrastructure facilities for working mothers, as well as their perception of environmental conditions as a support resource that helps to smooth out the family-work conflict and effectively combine parental and professional functions.

Results

Table 1 shows parents' overall assessment of urban environment of residential neighborhoods.

Table 2 shows the opinions of parents about the lack of walking distance infrastructure in the residential district.

Thus, it is the objects of child infrastructure that were the most scarce in terms of walking distance. The share of parents who noted the lack of infrastructure in the territorial proximity (walking distance) for the intellectual, physical, and cultural development of children is about 40%. In the

Table 1. Satisfaction of Yekaterinburg residents, who have preschool and school-age children, with the quality of urban environment*

Indicator	Urban environment elements	Average	Standard deviation	Median	Mode
I. Vital components of urban environment					
1	Environmental situation	3.20	1.181	3	4
2	Safety of living	3.38	1.092	4	4
II. Social and household infrastructure					
3	Housing and utility services (uninterrupted supply of energy resources, hot and cold water, major repairs of houses, garbage collection, etc.)	3.44	1.141	4	4
4	Availability of household services (dry cleaning, repair shops, etc.)	3.68	1.180	4	4
5	Medical services (quality of work of polyclinics, level of medical care)	3.03	1.146	3	3
III. Consumer infrastructure					
6	Markets and shopping centers	3.68	1.317	4	5
7	Public catering establishments (cafes, restaurants)	3.28	1.305	3	4
IV. Recreational infrastructure					
8	Entertainment industry (cinemas, bowling alleys, clubs, etc.)	2.88	1.413	3	1
9	Parks, green areas, recreation areas	3.70	1.246	4	5
V. Child infrastructure					
10	Sports services of open street access (stadiums, playgrounds, ice rinks)	3.41	1.309	4	4
11	Cultural and leisure centers for children (clubs, sections, development centers)	3.30	1.208	3	4
VI. Transport infrastructure					
12	Transport accessibility (developed transport network, convenience of routes, speed of movement to the city center)	3.67	1.262	4	5
13	Parking quality	2.52	1.163	2	2
VII. Aesthetics of urban environment					
14	Improvement of the neighborhood (street lighting, playgrounds, pedestrian zones, public spaces, etc.)	3.18	1.235	3	3
15	Appearance of a neighborhood (streets, roads, houses)	3.21	1.150	3	3
	Overall satisfaction	**3.30**	**0.750**	**3.33**	**3.27**

* A quantitative scale from 1 to 5 was used for the measurement.
Source: own compilation.

Table 2. Scarce walking distance urban infrastructure according to parents

No.	Type of urban infrastructure objects	Share of parents who assessed the scarcity of objects, %
1	Grocery store	11.2
2	Pharmacy	9.0
3	Polyclinic	24.7
4	Mail	19.4
5	Household services (dry cleaning, repair shops, etc.)	15.2
6	Kindergarten, school	18.3
7	Clubs, development centers for children	**38.1**
8	Sports sections for children	**43.4**
9	Sports facilities (swimming pools, fitness centers, ice rink, etc.)	**44.8**
10	Shopping and entertainment centers	29.3
11	Parks and recreation	**39.8**
12	Cafes, restaurants	28.9

Source: own compilation.

general list of scarce objects of child infrastructure, the main objects of daily demand – kindergarten, school – are not on top, but the results of in-depth interviews indicate that the lack of these objects is perceived most painfully, and it affects "conflict-free" opportunities for combining family and professional roles the most: "*Our school is far away, and it is very inconvenient. You must walk to the bus stop for about 15 minutes, go by bus for a while, and again walk from the bus stop to the school for nearly the same time. Moreover, we have such a bus route that it is almost always full of people. I was uncomfortable, my heart ached: how will my child go alone by bus, how will he get there? When he went to a kindergarten, it was another story, because it was necessary to bring him there by 8. It was difficult. Then we had to get him back. You work, get to this kindergarten, and come back. I was very tired, exhausted. I came home, I didn't need anything from life, I had no strength left for anything else"* (Marina, 34, has a 10-year-old son).

On the contrary, those informants who had a kindergarten and a school within walking distance estimate this fact as a significant advantage: *"Now, we have a kindergarten near the house, although at first we got a place in the Chapaev district that is far from us. I had to drive, and there was just a terrible road because of dirt and hour-long traffic jams on our way back. We went there for a week and gave up. Then the child stayed at home for nearly a year. We were waiting for a place in a kindergarten near the house. It is a different story now. Our older child really wants to take the younger one in the kindergarten and back, but he won't be allowed, because only an adult can do it. We have a school across the house, so it is also very convenient that the child goes everywhere on his own. In the first grade, I probably met him for two weeks, and then he began to return home on his own. I cannot imagine how parents who need to go to kindergarten and school live... Here is an Akademichesky, for example, a huge district was rebuilt, a lot of people moved there to live, and there is a noticeably big problem with kindergartens.... And when there is a territorial link to the kindergarten, this is a great advantage"* (Yulia, 35, has children aged 6 and 9 years).

For some working women, the absence of a municipal kindergarten near the house or inability to get into it (or a private kindergarten with acceptable conditions) was the reason for the decision to suspend their careers or find another job: *"At first, I worked as a mining engineer for a private company, but then I had to quit. My daughter went to kindergarten, and it was far away, so I had to make a choice – either to leave or look for a private kindergarten. As a result, I still had a strained relationship with my employer at that job, and I had to constantly ask for time off. So, I left. Then I stayed at home for a while, looking for a job, so that I could spend time with my family"* (Olga, 35, has children aged 7 and 9 years); "*In general, before this job, it turns out, I worked in a bank – the Ural Bank for Reconstruction and Development. I had a working week from 8 to 19:30, there was only one day of during a week and Sunday. And when Sofia went to the garden, and Liza went to the preparatory courses before the first grade, it was necessary to carry both. Either my husband and I leave together in the morning, take the youngest girl to the garden, or someone alone takes everyone back in the evening. Lisa's grandmother goes with her by bus when she has time. The problem is to connect everything when everyone is in different places. And we only have one car. So, I could not stand it, I quit and went to this job as a sales representative, so at any moment I could go away, pick up the child, take her to the pool, to the hospital, somewhere else, or stay at home with her..."* (Marina, 35, has children aged 4 and 9 years).

To make up for the lack of time and reduce the level of stress, working parents often must resort to the help of grandparents who could accompany a child to a kindergarten or school. Thus, mothers who are actively engaged in a professional career note that *"due to the workload, it was simply*

impossible to do without the help of my grandmother. Since we did not have a kindergarten and school near the house or on the way to work, duties of driving-bringing the child were completely assigned to my mother. So, when we went to school, my grandmother, although she was not planning it, left work to help us. When our grandmother leaves, the life turns into constant traveling around the city and traffic jams – to school, to dance, to English. It is terribly exhausting, and I do not have any strength in the evening" (Anna, 45, has a 9-year-old daughter and a 21-year-old son who lives separately).

The lack of help from older family members is compensated by the search for alternative models of accompanying children: *"When my son was little, I took him to a kindergarten, and father took him back. I do not take him to school now. His classmate's mother drives him there. That is, we all live close to each other, so she takes him with her son. Well... she can do it; she brings them in and takes them back. It turned out that they began to travel with her constantly in that year. And for me, an extra hour or two is a time when you can do a lot of things"* (Vika, 34, has a 10-year-old son).

In general, the location of child infrastructure facilities in Yekaterinburg often coincides with the place of residence of families with children. Depending on the type of infrastructure, the share of parents who noted that infrastructure facilities are in the residential district ranges from 56.9% (sports clubs) to 78.6% (kindergartens). Of all surveyed Yekaterinburg residents who have children of preschool and school age, 21.4% take their children to kindergartens, 23.4% – to schools, 33.1% – to clubs and development centers, 43.1% – to sports clubs located in other micro-districts *(Tab. 3)*.

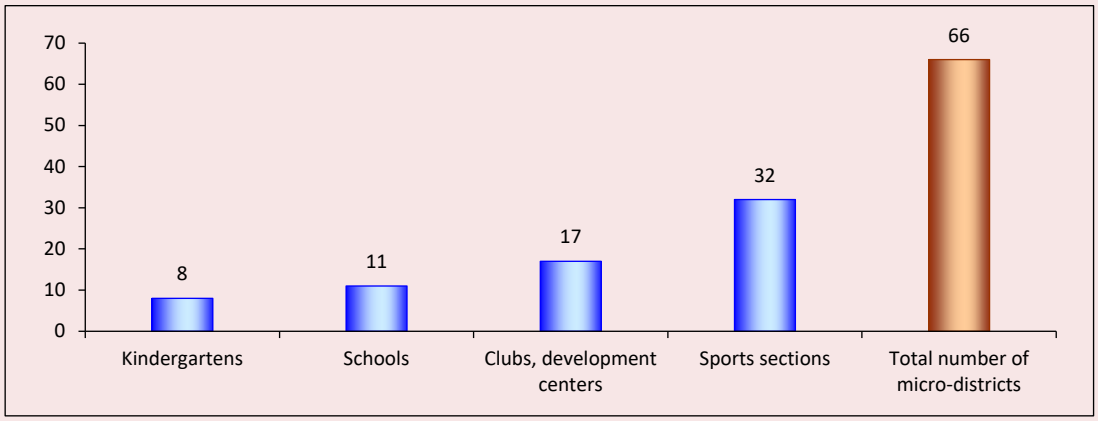
The results of the interviews show that the territorial "binding" of non-main objects of child infrastructure (clubs, development centers, sports sections) is also important for parents. When choosing additional types of education and development of their children, working parents, in conditions of time scarcity, focus primarily on territorial proximity, which allows children from a certain age to get to the necessary institutions independently: "*My son goes to karate and English courses. It is all in the next house. Where he can go himself, he goes there*" (Olga, 35, has children aged 7 and 10 years); "*Older child goes to a music school on his own because it is nearby. In the first year, in the first grade, we took him there, and, from the second grade, he goes there on himself, it is not far away, and we talked about the route in detail. Well, the advantage is that we live near the Shartash market, there are no large streets there, basically you need to go through the yards, so he goes alone. He also visits a development school, robotics, and chess. This is also literally two yards away, and he walks on his own"* (Yulia, 35, has children aged 6 and 9 years). This strategy – "we choose what is nearby" – is a rational mechanism for minimizing parental transit costs, but, in this case, it is not always possible to ensure that a child's abilities, needs, and desires correspond to the institutions available nearby.

During the study, we recorded a list of micro-districts, families with children from which are forced to demonstrate the highest level of intra-city mobility, moving to places of child infrastructure

Table 3. Location of urban infrastructure for children's development, % of parents who responded

Coincidence of the residential neighborhood with the neighborhood of the location of a child infrastructure object	Child infrastructure facilities			
	Kindergarten	School	Clubs, development centers	Sports sections
Coincide	78.6	76.6	66.9	56.9
Does not coincide	21.4	23.4	33.1	43.1
Total	100.0	100.0	100.0	100.0
Source: own compilation.				

Figure 1. Number of micro-districts in Yekaterinburg where families with children who are deprived of territorial proximity of child infrastructure facilities live



Source: own compilation.

and back. *Figure 1* shows a number of micro-districts where families with children are deprived according to each of the analyzed parameters.

Out of the total number of micro-districts in Yekaterinburg, three urban micro-districts were simultaneously deprived of all four categories of objects (Shirokaya Rechka, Sovkhozny, Yuzhny), of three objects – 6 micro-districts (Vokzalny, Shinny, Sinie Kamny, Shartash, Parkovy, Keramika), of three objects – 11 micro-regions (Akademichesky, Michurinsky, Zarechny, Izoplit, Istok, Elizavet, RTI, Shuvakish, Uktus, Novaya Sortirovka, Kalinovsky), of one object – 15 micro-regions (Polevodstvo, Ptitsefabrika, Avtovokzal, Vtorchemet, Botanichesky, Koltsovo, Lechebny, Medny, Nizhne-Isetskiy, Pionersky, Sortirovka, Tsentralny, Shartash Market, Elmash, Yugo-Zapadny). It should be noted that informants from infrastructurally "deprived" areas reacted most passionately and emotionally to questions about the importance of territorial proximity of child institutions: *"We bought an apartment in a remote area in Shirokaya Rechka. There are no kindergartens at all. They gave us a kindergarten far away from home. There is only one kindergarten here. And we did not get there, of course. Apparently, there is a very large queue. Again, we asked, we are two education workers, give us a closer kindergarten through some connections. But it did not work out. Even the money did not help. I had to travel far. And only a year later they gave us a closer kindergarten. But it is still necessary to go by a car. This is not a walking distance., We asked in an appeal why are so few kindergartens planned for construction in our district? Roughly speaking, the answer was: "No one asked you to buy an apartment so far away". Well, that is, you bought it yourself and now live there. What parks, what kindergartens? This is Shirokaya Rechka... No one wants us here"* (Ekaterina, 29, has a 5-year-old child); *"I went through all of this with my daughter. Heavily. We had no school nearby, no kindergarten. We bought an apartment in a young residential area, in a nice house, but without everything. There is absolutely nothing nearby. I always must think of something, ask someone. I remember when my friend picked up my child from school and brought him to her home during frosts, because I was working and could not come. I need support from the authorities. Well, why don't you build a school or a kindergarten in our district? At least I go to the hospital for free. Thank you for that at least"* (Ol'ga, 33, has children aged 2 and 8 years).

The coincidence of the residential neighborhood and the location of child infrastructure facilities is shown in the overall assessment of the quality of life of the respondents-parents in the neighborhood. *Figure 2* shows significant statistical differences supporting this statement (Mann–Whitney test, p=0.000).

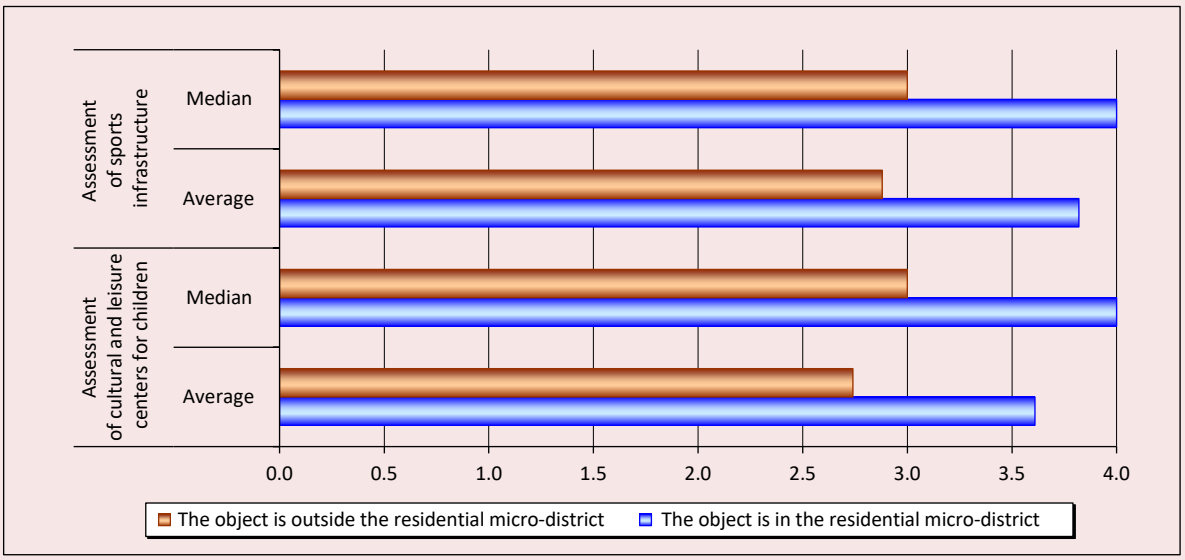
Consequently, the assessment of cultural and leisure centers for children in respondents' residential districts is higher when they take their children to clubs and development centers located in their own neighborhood. Similarly, the assessment of the infrastructure for child sports in respondents' residential district is higher when they take their children to sports clubs located in their own neighborhood.

The presence of infrastructure for children in the residential area of respondents is associated with the assessment of the neighborhood according to several parameters – and not only on those aspects that seem to relate directly to children. For example, respondents-parents, whose kindergarten is not located in the residential district, evaluate their neighborhood worse than parents who live in the residential district with a kindergarten, only by one parameter. If the residential district does not coincide with the residential district with a school, then it is assessed lower by 8 parameters. Due to the lack of a sports section, where the respondents-parents take their children, the neighborhood receives lower ratings according to 11 parameters, and due to the lack of clubs and development centers – according to 15 parameters. In *table 4*, the orange color indicates the parameters for which neighborhoods received lower ratings if they did not have certain elements of child infrastructure.

Discussion

Our research is a kind of "pioneer" in terms of the choice of research focus (analysis of urban environment as a condition for successful combination of parental and professional functions) and the developed methodology for assessing spatial differences in the saturation of urban

Figure 2. Assessments of individual parameters of residential neighborhoods by respondents-parents (groups of respondents identified by the principle of the location of a child infrastructure object in/outside the residential area)



Source: own compilation.

Table 4. Results of the comparative analysis of the urban environment quality in case of the location of child infrastructure facilities outside the residential area

Indicator	Urban environment elements	A lower rating given by the respondents-parents, provided that it is necessary to use a child infrastructure object outside the residential district			
		Kindergarten	School	Clubs, development center	Sports section
I. Vital components of urban environment					
1	Environmental situation				
2	Safety of living				
II. Social and household infrastructure					
3	Housing and utility services (uninterrupted supply of energy resources, hot and cold water, major repairs of houses, garbage collection, etc.)				
4	Availability of household services (dry cleaning, repair shops, etc.)				
5	Medical services (quality of work of polyclinics, level of medical care)				
III. Consumer infrastructure					
6	Markets and shopping centers				
7	Public catering establishments (cafes, restaurants)				
IV. Recreational infrastructure					
8	Entertainment industry (cinemas, bowling alleys, clubs, etc.)				
9	Parks, green areas, recreation areas				
V. Child infrastructure					
10	Sports services of open street access (stadiums, playgrounds, ice rinks)				
11	Cultural and leisure centers for children (clubs, sections, development centers)				
VI. Transport infrastructure					
12	Transport accessibility (developed transport network, convenience of routes, speed of movement to the city center)				
13	Parking quality				
VII. Aesthetics of urban environment					
14	Improvement of the neighborhood (street lighting, playgrounds, pedestrian zones, public spaces, etc.)				
15	Appearance of a neighborhood (streets, roads, houses)				
	Overall satisfaction				

Source: own compilation.

neighborhoods with child infrastructure objects and their pedestrian accessibility (using sociological, rather than statistical methods). Despite the fact that the amount of works devoted to the quality of urban environment has been steadily growing in the last decade, there are currently no similar studies in the scientific literature focusing on the impact of accessibility of urban environment on achieving a balance of various spheres of life (in particular, family and professional), performed with a high level of spatial detail (in the micro-space section) and the use of sociological tools for comprehensive coverage of all inner-city territories (residential neighborhoods) without exception.

The results of the study show that the overall satisfaction of urban parents with child infrastructure facilities does not significantly differ from the satisfaction with other elements of urban environment. However, the share of parents experiencing a shortage of child infrastructure facilities within walking distance from their places of residence significantly exceeds the share of those who name other urban services scarce. Even though the objects of child infrastructure are mainly located in the residential district, this coincidence cannot be considered "ideal" in terms of the infrastructure saturation of the residential places. First, many Yekaterinburg micro-districts have a territorial extent that exceeds the radius of comfortable pedestrian accessibility, which does not allow considering the location of objects within formal boundaries of a micro-district as the only criterion for environmental well-being. In addition, the results of in-depth interviews with mothers indicate that pedestrian inaccessibility of key child infrastructure objects is a relevant problem for successful combination of parental and professional responsibilities, since it significantly complicates daily logistics and does not contribute to saving time, rational distribution of energy and effort.

Second, the share of parents who are forced to use child infrastructure facilities outside of their residential neighborhoods is still remarkably high – from 21 to 43%. At the same time, the highest forced mobility is recorded in the sphere of meeting the needs of intellectual, creative, and sports development of children.

Out of 66 urban micro-districts, many of them (35) are considered deprived according to various criteria, and, among them, there are not only residential new buildings or areas that are geographically remote from the core of cultural and educational life of the city, but also territories that are central and close to the center. Special attention from the authorities, in our opinion, should be paid to the infrastructural development of micro-districts that are, at the same time, disadvantaged by several criteria. In them, families with children find themselves in the worst environmental conditions, forcing them either to make exorbitant efforts to meet the development needs of their children, or to refuse non-basic (but significant for children) developmental services.

A significant result of our study is the fact that there is a direct relationship between parents' assessments of the availability of child infrastructure in a nearby vicinity of their residential places and overall satisfaction with the quality of urban life. A high subjective significance of the territorial proximity of child infrastructure objects for parents in the overall picture of the perception of the comfort of urban environment reflects the specific lifestyle and needs of the studied group of citizens, which must be considered when developing strategies for the development of urban neighborhoods.

The emergence of spatial inequalities associated with restrictions on access to urban goods and infrastructure, differentiation of the quality and functional saturation of urban environment, and transport deprivation in several districts is today one of the most significant problems, the solution of which requires the development of comprehensive programs for the formation of a functionally saturated environment at the level of microlocal territories. The processes of urban sprawl, combined with the unresolved transport problems in megapolises, lead to the isolation of certain urban areas, whose residents are "disconnected" from the social infrastructure and the benefits of urban life. They must make intra-city trips several times a day, often overcoming all sorts of environmental barriers, including unfavorable urban traffic conditions.

In the light of the identified problems, the models of urban development that allow leveling the intra-city territorial imbalances of the living

environment become particularly relevant. One of the progressive models that integrates a set of guidelines for sustainable urban development (compactness, polycentrism, environmental friendliness, anthropo-orientation) is the "15-minute city model", proposed by the Franco-Colombian researcher C. Moreno [29]. It is based on the idea of decentralizing urban life. The city of quarter hour is a mosaic of urban neighborhoods, within which all the key urban functions are concentrated –housing, work, retail, medical services, education, culture, leisure, recreation. The theoretical basis of the 15-minute model is the concept of "chrono-urbanism", which considers the quality of urban life as a "quantity" inversely proportional to the amount of time spent on everyday transit [30]. Hyper-proximity is the availability of key services/amenities and its corresponding micro-mobility contribute to the achievement of a set of positive effects, such as reduced dependence on cars (saving environmental resources), saving time and financial costs for transit (reallocation of time and costs for other activities – leisure, recreation, family, and parental responsibilities), improvement of the local quality of life (diversity in all its manifestations at the level of inner-city areas), "reunion" of residents with their local areas, and formation of a local identity (strengthening of the social "fabric" of urban life).

We believe that the 15-minute city model is not "rigid", so it can be adapted to the specific features of specific cities, their scale, morphology, characteristics of inner-city territories, and the needs of residents. The latter seems particularly important to us since the need to consider the needs and opinions of residents is becoming increasingly obvious because of widely discussed issues of citizens' involvement in the processes of designing urban changes [31]. The involvement of residents in the evaluation and selection of projects to be implemented on their own territory, as shown by the experience of progressive foreign megapolises (for example, Paris, Ottawa, Melbourne[2]), which have already begun to implement the "hyper-proximity-accessibility" model, plays an important role in achieving the goals of creating a high-quality and affordable urban environment, the formation of sustainable and socially interconnected communities, and, ultimately, the birth of healthier cities in the ecological, economic, and social aspects.

Conclusion

As a result of our study on the accessibility of urban environment for families with children in the territorial-local projection, we reveal, on the one hand, the problems of infrastructural imbalance in the development of urban neighborhoods of a particular metropolis – Yekaterinburg – which prevent the effective combination of parental and professional functions. On the other hand, the authors focus on the fact that the implementation of the priority federal project "Creating a comfortable urban environment" requires not only small tactical decisions on the improvement and "beautification" of urban spaces, but also the development of long-term strategic approaches to the development of Russian cities. Strategic objectives for the formation of a high-quality, functionally rich environment at the level of urban micro-territories actualize the issues of "upgrading" the existing infrastructure conditions in accordance with the needs of residents. In this context, the results obtained are of high practical significance since they can be

[2] See: *Paris en Commun. Le programme d'Anne Hidalgo.* Available at: https://annehidalgo2020.com/le-programme/;

Welcome to the 15-minute neighbourhood: Intensification key to city's official plan. Ottawa. August 23, 2019. Available at: https://www.cbc.ca/news/canada/ottawa/ottawa-first-glimpse-official-plan-1.5256386; 20-minute neighbourhoods. Create more inclusive, vibrant, and healthy neighbourhoods. *Victoria State Government.* Available at: https://www.planning.vic.gov.au/policy-and-strategy/planning-for-melbourne/plan-melbourne/20-minute-neighbourhoods#:~:text=Hallmarks%20of%2020%2Dminute%20neighbourhoods&text=Work%20undertaken%20in%20partnership%20with,cyclists%20to%20optimise%20active%20transport (accessed: March 2, 2021).

used to make informed management decisions to prevent a sharp polarization in the development of urban areas. Based on the conducted research, we conclude that a functionally rich, pedestrian-accessible urban environment that minimizes the forced "costly" mobility of families for the purposes of education, development, and leisure of children (they increase in the megalopolis due to the phenomenon of intensive motherhood described by sociologists) can act as a significant resource (along with economic and corporate measures to support families – family-friendly policies) for the successful combination of parental and professional functions, ultimately contributing to improving the quality of life and subjective well-being of citizens with children.

References

1. Maclnnes J. Work-Life balance in Europe: A response for the baby bust or reward for the baby boomers? *European Societies*, 2006, vol. 8 (2), pp. 223–249. DOI: 10.1080/14616690600644988
2. Rozhdestvenskaya E.Yu. Academic careers of women: The balances and mbalances of life and work. *Monitoring obshchestvennogo mneniya: ekonomichekie i sotsial'nye peremeny=Public Opinion Monitoring: Economic and Social Changes*, 2019, no. 3, pp. 27–47. DOI: 10.14515/monitoring.2019.3.03 (in Russian).
3. Remery C., Schippers J. Work-family conflict in the European Union: The impact of organizational and public facilities. *International Journal of Environmental Research and Public Health,* 2019, vol. 16 (22). DOI: 10.3390/ijerph16224419
4. Brauner C., Wöhrmann A.M., Frank K., Michel A. Health and work-life balance across types of work schedules: A latent class analysis. *Applied Ergonomics*, 2019, vol. 81. DOI: 10.1016/j.apergo.2019.102906
5. McCanlies E., Mnatsakanova A., Andrew M., Violanti J., Hartley T. Childcare stress and anxiety in police officers moderated by work factors. *Policing: An International Journal,* 2019, vol. 42 (6), pp. 992–1006. DOI: 10.1108/PIJPSM-10-2018-0159
6. Rozhdestvenskaya E.Yu., Isupova O.G. Work-life balance: Family, leisure, and professional activity. *Monitoring obshchestvennogo mneniya: ekonomichekie i sotsial'nye peremeny=Public Opinion Monitoring: Economic and Social Changes*, 2019, no. 3, pp. 3–7. DOI: 10.14515/monitoring.2019.3.01 (in Russian).
7. Kalabikhina I.E., Shaikenova Zh. D. Estimation of time transfers within households. *Demografichiskoye Obozrenie=Demographic Review*, 2019, no. 5 (4), pp. 36–65 (in Russian).
8. Patrushev V.D. *Zhizn' gorozhanina (1965–1998)* [Life of a Citizen (1965–1998)]. Moscow: Academia, 2000.
9. Nartova N.A. Motherhood in contemporary Western sociological debate. *Zhenshhina v rossiiskom obschestve=Woman in Russian Society*, 2016, no. 3 (80), pp. 39–53 (in Russian).
10. Avdeeva A., Isupova O., Kuleshova A., Chernova Zh., Shpakovskaja L. *Roditel'stvo 2.0: Pochemu sovremennye roditeli dolzhny razbirat'sa vo vsem?* [Parenting 2.0: Why modern parents should understand everything?] Moscow: Alpina Publisher, 2021. 164 p.
11. Isupova O.G. Intensive motherhood in Russia: Mothers, daughters, and sons in school growing. *Neprikosnovennyi zapas. Debaty o politike i kul'ture=Inviolable Reserve. Debates about Politics and Culture*, 2018, no. 3, pp. 180–189 (in Russian).
12. Olivetti C., Petrongolo B. The economic consequences of family policies: Lessons from a century of legislation in high-income countries. *Journal of Economic Perspectives,* 2017, vol. 31 (1), pp. 205–230. DOI: 10.1257/jep.31.1.205
13. Stanczyk A. Does paid family leave improve household economic security following a birth? Evidence from California. *Social Service Review*, 2019, vol. 93 (2). DOI: 10.1086/703138
14. Breeschoten L., Evertsson M. When does part-time work relate to less work-life conflict for parents? Moderating influences of workplace support and gender in the Netherlands, Sweden, and the United Kingdom. *Community, Work & Family*, 2019, vol. 22 (5), pp. 606–628. DOI: 10.1080/13668803.2019.1581138

15. Beham B., Drobnič S., Präg P., Baierl A. & Eckner J. Part-time work and gender inequality in Europe: A comparative analysis of satisfaction with work–life balance. *European Societies*, 2019, vol. 21 (3), pp. 378–402. DOI: 10.1080/14616696.2018.1473627
16. Gehl J. *Cities for People*. Moscow: Alpina Publisher, 2012. 276 p.
17. *Bor'ba za gorozhanina: Chelovecheskii potentsial i gorodskaya sreda* [Struggle for the citizen: Human potential and urban environment]. Ed. by A. Vysokovsky. Moscow: NRU HSE Graduate School of Urbanism; IV Moscow Urban Forum, 2014. 102 p.
18. Kabisch S., Koch F., Gawel E., Haase A., Knapp S., Krellenberg K., Nivala J., Zehnsdorf A. *Urban Transformations: Sustainable Urban Development through Resource Efficiency, Quality of Life and Resilience*. Dordrecht: Springer, 2018. 384 p. DOI: 10.1007/978-3-319-59324-1(2018)
19. Naberushkina E.K. A city for everyone: Sociological analysis of accessibility of urban space for disabled people. *Zhurnal sotsiologii i sotsialnoy antropologii=The Journal of Sociology and Social Anthropology*, 2011, vol. 14, no. 3, pp. 119–139 (in Russian).
20. Shabunova A.A., Natsun L.N. The urban environment accessibility for people with disabilities. *Voprosy territorialnogo razvitiya=Territorial Development Issues*, 2014, no. 3 (13), pp. 1–15 (in Russian).
21. Lebedeva E.V. Children and youth in a modern city: Sociological analysis. *Sotsiologiya=Sociology*, 2013, no. 2, pp. 122–132 (in Russian).
22. Filipova A.G., Lebedeva E.V. Child and youth friendliness of the urban environment: From theoretical approaches to expert interpretations. *Oikumena. Regionovedcheskie issledovaniya=Ojkumena. Regional Researches*, 2019, no. 2. pp. 101–112 (in Russian).
23. Balakireva M.S. Everyday mobility study of town dwellers with children: Application of mixed method research strategy. *Interaktsiya. Interv'yu. Interpretatsiya=Interaction. Interview. Interpretation*, 2015, no. 10, pp. 60–69 (in Russian).
24. Shpakovskaya L.L., Chernova Zh.V. A family-friendly city: A new public space for children and their parents. *Monitoring obshchestvennogo mneniya: ekonomichekie i sotsial'nye peremeny=Public Opinion Monitoring: Economic and Social Changes*, 2017, no. 2, pp. 160–177 (in Russian).
25. Kienko T.S. Elderly citizens and the audiovisual environment of the city: Age as a factor of solidarity with space. *Zhurnal sotsiologii i sotsialnoy antropologii=The Journal of Sociology and Social Anthropology*, 2019, vol. 22, no. 4, pp. 57–87. DOI: 10.31119/jssa.2019.22.4.3 (in Russian).
26. Van Hoof J., Kazak K.J., Perek-Białas M.J., Peek T.M.S. The challenges of urban ageing: Making cities age-friendly in Europe. *International Journal of Environmental Research and Public Health,* 2018, vol. 15. DOI: 10.3390/ijerph15112473
27. Glazychev V.L. *Sotsial'no-Ekologicheskaya Interpretaciya Gorodskoy Sredy* [Socio-Ecological Interpretation of Urban Environment]. Moscow: Nauka, 1984. 180 p.
28. Dridze T.M. Human and urban environment in predictive social design. *Obschestvennye nauki i sovremennost'=Social Sciences and Contemporary World*, 1994, no. 1, pp. 131–138 (in Russian).
29. Moreno C. *Droit de cité, de la "ville-monde" à la "ville du quart d'heure*". De l'Observatoire, 2020. 179 p.
30. Mulíˇcek O., Osman R., Seidenglanz D. Urban rhythms: A chronotopic approach to urban timespace. *Time & Society*, 2014, vol. 24 (3), pp. 304–325. DOI: 10.1177/0961463X14535905
31. Maksimov A.M., Nenasheva M.V., Vereshchagin I.F., Shubina T.F., Shubina P.V. Creating a comfortable urban environment: Problems of interaction between society and government in the implementation of priority projects at the management municipal level. *Ekonomicheskiye i sotsialnye peremeny: fakty, tendentsii, Prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2021, vol. 14, no. 1. pp. 71–90. DOI: 10.15838/esc.2021.1.73.6 (in Russian).

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Necessity-Based and Opportunity-Based Entrepreneurship: Socio-Demographic Features of the Employed and Their Potential Realization*

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Abstract. Entrepreneurship is considered as a source of increasing economic competitiveness, emergence of innovations, creation of jobs, and realization of public goals. The article shows that the achievement of economic goals is associated not only with entrepreneurship, but also with its individual types (necessity-based and opportunity-based). The author pays attention to identifying the types of entrepreneurship (necessity-based and opportunity-based), determining socio-demographic features of population involved in these types, how representatives of the selected types of work perception, realize the accumulated potential, what type of earnings they prefer (stable, but low incomes / high incomes, but with no guarantees for the future). Information data of the research is data monitoring of the quality of labor potential of the Vologda Oblast population for 2020. In the course, the work identifies the groups of factors that affect the prevalence of these entrepreneurship types (in one case, it is macroeconomic stability, institutions, infrastructure, etc., in the other – for technological improvement, for higher education, vocational training, and efficient markets). The research reveals common features of necessity-based and opportunity-based entrepreneurs and their differences. The author proves that opportunity-based entrepreneurs perceive their activities to a greater extent from the position of focusing on earning respect

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and recognition, gaining new knowledge, and realizing their potential. They are more likely to rate their prospects for professional development, career growth and professional improvement higher than other groups of entrepreneurs. The practical significance of the study is to identify groups of opportunity-based and necessity-based entrepreneurs, characteristics peculiar to each of them, and to highlight their common and different features. In turn, the latter creates prerequisites for the authorities in terms of creating conditions for each of the groups of entrepreneurs, determining the most effective and successful incentives for activating their potential.

Key words: opportunity-based entrepreneurship, necessity-based entrepreneurship, socio-demographic features, work perception, readiness for professional development.

Relevance of the research

In socio-economic state development, a significant role belongs to entrepreneurship which is considered as a source of increasing economic competitiveness, emergence of innovations, job creation, and implementation of public goals [1]. The contribution of small and medium-sized enterprises to the economy of developed countries is 50% of gross domestic product. In Russia, in accordance with the national project "Small and Medium-Sized Enterprises and Support for Individual Entrepreneurial Initiative", the values of this indicator are planned to increase to 32.5% by 2024 (in 2018 it was 20,2%)[1].

Russian studies (for instance, [2, p. 176]) justify the influence of entrepreneurship on economic development. We are talking about the fact that with the growth of the number of small and medium-sized enterprises by 1% in the regions, there will be an increase in GRP by 0.06–0.17%. At the same time, the elimination of half of the organizations in the territory can lead to a reduction in GRP by an average of 3–10% per year [3, p. 176]. The consequences of this may be a reduction in the production of goods and services, informal employment and unemployment, and a drop in business income.

According to the Global Entrepreneurship Monitoring (GEM), Russia is one of the countries with a low level of entrepreneurial activity. Over the previous decades, SMEs' role remains quite modest: no more than 22% of GDP, about 27% of employment [4]. According to GEM (2018–2019[2]), in Russia, only 0.7% of respondents indicated their involvement in initiatives related to intra-company entrepreneurship (while the average for the global report reached 4%). At the same time, we should note that in 2018, three-quarters of respondents closed their businesses due to non-profitability. This indicator is considered as a "record" for all the time in Russia and the largest of all the countries participating in global monitoring. In 2019, the number of SMEs decreased by 100 thousand and the number of employed – by almost half a million [5].

The situation may be aggravated by the crisis phenomena in the economy in 2020, accompanied by long-term negative consequences for economic development, departure of voluntary entrepreneurs (whose number is already low) from the market [6]. The thesis about the connection of economic development with a certain type of entrepreneurship, and not only with entrepreneurship as such, is reflected in the works of Russian and foreign

[1] Eroshenko E.P. *Organizational and Economic Mechanism of Youth Entrepreneurship Development on the Basis of Interaction with Partners of the University: Autoabstract and Dissertation of Economic Sciences*. 08.00.05. Yekaterinburg, 2020. P. 3.

[2] Global Entrepreneurship Monitoring. Russia 2018–2019: national report. Available at: https://gsom.spbu.ru/files/folder_17/otchet_fin_rgb.pdf (accessed: January, 10, 2021).

scientists. For example, Baumol emphasized the connection between economic development in the country and distribution of "entrepreneurial talents" between different types of entrepreneurial activity [7, p. 53]. Similar conclusions are in other studies [8; 9; 10]: economic development is promoted not so much by an increase in the total number of entrepreneurs, but by entrepreneurs with high growth potential who produce innovative products.

As we have shown above, entrepreneurship (and its types) contributes to economic development, and therefore the authorities attach great importance to its support and the definition of parameters that affect its scale and intensity. *The purpose of the research is to analyze the prevalence of voluntary and forced entrepreneurship in the Vologda Oblast. The tasks are to consider the socio-demographic characteristics of opportunity-based and necessity-based entrepreneurs; to study their perception of their activities (from the point of view of achieving success, self-realization, etc.).); in assessing professional prospects, as well as readiness for certain actions.*

Theoretical aspects of the research

The analysis of scientific literature has shown that the entrepreneur's characteristics are taken into account when determining the economic essence of entrepreneurship. Among the authors of the first studies on the theory of entrepreneurship are R. Cantillon and A. Smith. It is believed that the term "entrepreneurship" was first introduced into scientific circulation in the 18th century [11]. Traditionally, entrepreneurship is understood as risky economic activity aimed at systematically making a profit from production and sale of goods, the provision of services, and the performance of work. In one of our earlier studies, when describing entrepreneurship, we emphasized its "creative aspects" – the focus on the search for new creative ideas, their analysis, and implementation in practice which can be manifested, for example, in improving production management [12, p. 126].

In their activities, entrepreneurs are guided by different motives and evaluate the benefits received in different ways [13, p. 132]. Given the differences in motivation for entrepreneurship, there are opportunity-based and necessity-based entrepreneurship. The concept of "necessity-based entrepreneurship" was first used in 2001 as a part of the global entrepreneurship monitoring. It is understood as entrepreneurship which is carried out under the influence of external circumstances: the lack of alternative income opportunities, the need to ensure survival in an alien environment, a sharp drop in the status and prestige of former profession [14, p. 25–26]. Necessity-based entrepreneurs were characterized as those who had no job opportunities or were in danger of losing their jobs in the near future[3]. Opportunity-based entrepreneurship is based on the desire to realize business opportunities.

The prevalence of entrepreneurial activity is influenced by various factors depending on the level of the countries' development. In resource-based countries, according to the Global Entrepreneurship Monitoring (GEM), necessity-based entrepreneurship is becoming more widespread, influenced by such basic factors as institutional development, infrastructure, macroeconomic stability, health and primary education. At the same time, in economies based on innovation, opportunity-based entrepreneurship is more common for which the key is to create conditions for technological improvement, higher education, professional training, and effective commodity, financial, and labor markets.

The propensity for entrepreneurship can be determined not only by the indicated factors, but also by the motivation for this activity (necessity-based and opportunity-based). In the scientific literature, there are debatable positions regarding certain factors that affect different types of

[3] Bosma N., Acs Z.J., Autio E., Coduras A., Levie J. *Global Entrepreneurship Monitor. 2008 Executive Report, 2009.* 68 p.

entrepreneurship. A negative factor for necessity-based entrepreneurship can be an insufficient level of abilities and skills in relation to the required level for this activity due to propensity to entrepreneurship due to the deterioration of socio-economic environment [15]. Nevertheless, the research recognizes that in some cases, even the presence of specific abilities may not always lead to entrepreneurship, as they can be implemented in other types of activities [16]. In this regard, taking into account the type of motivation in the analysis is an urgent scientific task. The importance of considering this aspect may be due to another circumstance: not all countries with a high level of income are equally widespread in opportunity-based entrepreneurship, as well as in countries with low incomes, the key incentive for business organization is not always external circumstances [17, p. 109].

Country's economic development is linked to availability of people who have business opportunities and have the experience and skills to use them[4]. We assume that in the future, the level of entrepreneurial activity in the country may increase due to implementation of population's intentions to create their own business. There is already a positive trend (an increase in the share of entrepreneurs from the working-age population to 9.3%), as evidenced by the data of the GEM national report (2019–2020, Russia).

Despite the entrepreneurial activity growth, external circumstances remain the key motive for engaging in entrepreneurship. In 78% of cases, entrepreneurship was a way to solve employment problems, and in 69% of cases, it was a way to ensure financial well-being[5]. Thus, the incentive to open their own business for necessity-based entrepreneurs becomes a straitened financial situation.

Conditionality of population's involvement in necessity-based entrepreneurship is also associated with dissatisfaction with work or lack of it, dissatisfaction with career opportunities, wages, etc. [18]. In the case of ooportunity-based entrepreneurship, the situation is different. Favorable conditions due to the formation of large markets and reduction of investment risks over the previous ten years have led to the formation of more than a third of new organizations in Moscow, about 10% in St. Petersburg [19, p. 174], the favorable investment climate contributed to the increase in entrepreneurial activity in the Kaluga, Tyumen, and Voronezh Oblasts.

We have already mentioned how a favorable socio-economic environment can have a positive impact on entrepreneurship development. The opposite statement is also true, as evidenced by data of the Department of International and Regional Cooperation of the Accounts Chamber of the Russian Federation[6]. A decrease in effective supply and demand, gaps in supply chains, and reduction in investment can have a negative impact on doing business. The COVID-19 crisis has led to an unprecedented decline in economic activity. The latter may be negatively affected by the "shock of consumer demand", the postponement of investment projects, and the inability of organizations to fulfill their financial obligations in a timely manner. All of the above can affect entrepreneurship in general, and especially necessity-based entrepreneurship which is more

[4] Factors affecting the development of small and medium-sized businesses. Available at: https://atameken.kz/uploads/content/files/%D0%A4%D0%B0%D0%BA%D1%82%D0%BE%D1%80%D1%8B%2C%20%D0%B2%D0%BB%D0%B8%D1%8F%D1%8E%D1%89%D0%B8%D0%B5%20%D0%BD%D0%B0%20%D1%80%D0%B0%D0%B7%D0%B2%D0%B8%D1%82%D0%B8%D0%B5%20%D0%9C%D0%A1%D0%91.pdf (accessed: January 11, 2021).

[5] Experts of the GSoM SPbu: global entrepreneurship monitoring showed a record growth in the number of new companies in Russian before the pandemic. Available at: https://gsom.spbu.ru/all_news/event2020-06-17/ (accessed: January 11, 2021).

[6] The COVID-19 pandemic impact on industry and environment. Available at: https://ach.gov.ru/upload/pdf/Covid-19-prom.pdf

susceptible to changes in the external environment, while those for whom the "internal motivators" for entrepreneurship are leading have opportunities for recovery and stabilization after crisis phenomena (for example, technological entrepreneurs have the potential to respond to crisis phenomena).

In the study, among the parameters that determine population involvement in necessity-based and opportunity-based entrepreneurship, we will primarily consider socio-demographic characteristics, as well as aspects related to the perception of entrepreneurs of their activities (self-realization, success achievement, moral satisfaction), potential realization, and willingness to improve themselves in a professional direction [20].

Information base and methodological aspects of the research

Information base of the research is monitoring data of the quality of labor potential of the Vologda Oblast population conducted by the FSBIS VolRC RAS in 2020. The object of the study is the working-age population of the Vologda Oblast. The survey was in Vologda and Cherepovets, as well as in eight districts of the region (Babaevsky, Velikoustyugsky, Vozhegodsky, Gryazovetsky, Kirillovsky, Nikolsky, Tarnogsky and Sheksninsky). The sampling method is zoning with proportional placement of observation units. The sample type is quota-based by gender and age. The sample size is 1500 people; its error does not exceed 3–4%.

The study focuses not just on the working-age population, but on entrepreneurs, who decided to engage in this type of activity is determined not only by external circumstances, but also by internal prerequisites. Due to this a subsample was formed from the sample population for subsequent analysis. The respondents were selected based on the answer to the question "How are your relationships formed in your main job?" (possible answer "I am an individual entrepreneur/self-employed"). We identified necessity-based entrepreneurs when choosing a positive answer on the following aspects: "I have to engage in entrepreneurship because I can not find a more decent job (including for hire)", "If I could choose, I would prefer to do something else"; opportunity-based: "Entrepreneurship allows me to realize myself professionally", "Entrepreneurship provides me with an acceptable prosperity level".

Within the framework of the research, opportunity-based and necessity-based entrepreneurs were considered from the standpoint of socio-demographic characteristics, job perception, assessment of professional prospects, and readiness to carry out certain actions.

In the course of the analysis, the author pays attention to some aspects:

– the article analyzes *perception of work* in relation to the following aspects: to feed yourself (family), to feel safe, to earn respect, recognition, to realize yourself as a person, to achieve success, to earn money, to make a career, to gain new knowledge; it was evaluated from the standpoint of agreement / disagreement with certain aspects of work ("absolutely agree", "agree", "not sure", "disagree");

– the paper considers *professional prospects* in terms of professional development, career growth, decent pay, self-realization in the profession; they were characterized from the positions of "high" and "rather high", "rather low" and "low";

– the work assesses *readiness to carry out certain actions* from the standpoint of mastering new knowledge and skills, organizing your own business, mastering new values and patterns of behavior, using new technologies in work and everyday life, and other aspects; it was considered from the standpoint of "not ready", "ready" and "ready and already implementing".

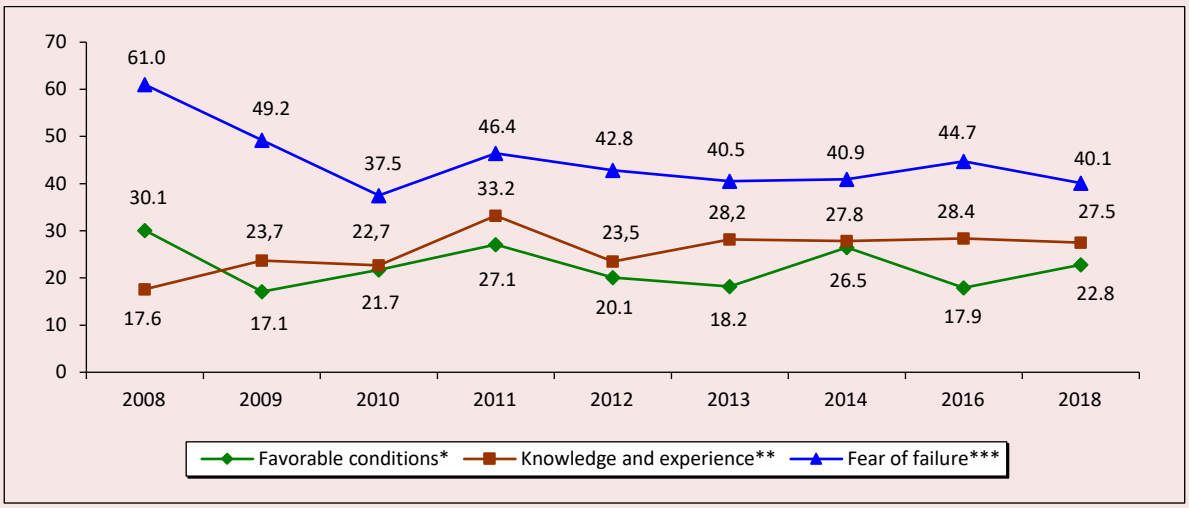
Research results

Turning to the research results, first of all, we note the factors that influence exact entrepreneurship. Such data contain in the global entrepreneurship monitor that notes that over the previous decade, the number of people experiencing the fear of failure has decreased by 20%, while the number of people realizing the importance of knowledge and experience, on the contrary, has increased *(Fig. 1)*.

According to the results of expert assessments, the factors that have the greatest impact on entrepreneurship are the dynamics of markets, access to infrastructure, vocational education, cultural and social norms. At the same time, the significance of these factors increased in 2011–2018 *(Fig. 2)*.

Speaking about the research results, we note that among individual entrepreneurs and self-employed women predominated (54% vs. 46% of

Figure 1. Assessment of business perception factors, % of the number of respondents



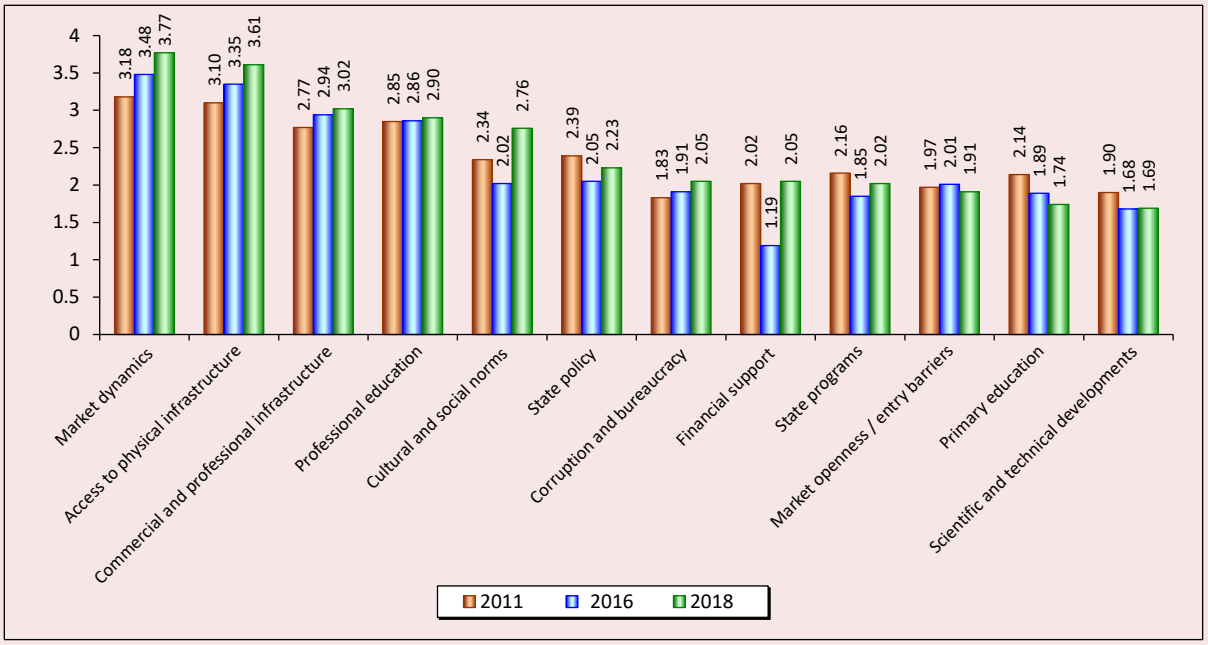
* Assessment of the extent to which the environmental conditions in the area where the respondent lives are favorable for starting a business in the next 6 months. In this case, we are not talking about an objective assessment of environmental factors, but about how the conditions of the external environment are perceived by the individual. On the other hand, this assessment may partly indicate whether an individual is able to see business opportunities in the national business environment.

** Assessment of the individual's own knowledge, qualifications and experience necessary to start a business. Greater confidence in the availability of the necessary knowledge and skills not only affects the personal attitude to creating a business and increases entrepreneurship's attractiveness as a career, but also affects the perception of how easy it is to succeed in an entrepreneurial activity. This indicator is related both to the overall confidence of individual in their own abilities, and to the assessment of availability of appropriate skills and knowledge necessary for conducting business.

*** Fear of failure in business, holding back the creation of your own business. In the vast majority of cases, starting your own business is associated with uncertainty about future and income opportunities. The attitude to risk is considered as one of the characteristics of individual that determines the desire to become an entrepreneur along with the desire for achievements and control locus. Individuals who are not willing to take risks and are afraid of being unsuccessful are less likely to create their own business, even if there are or are not opportunities in the market.

Source: Global Entrepreneurship Monitoring: national report. Available at: https://gsom.spbu.ru/files/folder_17/otchet_fin_rgb.pdf (accessed: December 07, 2020).

Figure 2. Factors conducting and hindering entrepreneurship development in Russia, average score on five-point scale



Source: Structural factors of entrepreneurship development, average score in points on a five-point scale. Available at: https://gsom.spbu.ru/files/folder_17/otchet_fin_rgb.pdf; http://my-trust.ru/upload/iblock/963/vtgokurcvf%20cqnkzooblv%20bqtbprcixvntouhzpyb%20 keebso%202011.pdf

Table 1. Characteristics of individual entrepreneurs or self-employed depending on gender and age, share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed

Possible answer	% of respondents	Gender		Age	
		Male	Female	Up to 30 years	After 30 years
Share of categories among IE and self-employed, %	*100.0*	*45.7*	*54.3*	*20.0*	*80.0*
Entrepreneurship is my main activity	81.8	84.6	79.3	75.0	83.7
Entrepreneurship provides me with an acceptable prosperity level	65.5	69.2	62.1	75.0	62.8
Entrepreneurship allows me to realize myself professionally	69.1	73.1	65.5	83.3	65.1
I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	41.8	53.8	31.0	25.0	46.5
If I could chose, I would prefer something else	14.5	11.5	17.2	0.0	18.6
Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.					

men), as well as population over 30 years of age (80% vs. 20; *Tab. 1*). Among men, entrepreneurship was considered as the main activity in 85% of cases. Almost three-quarters of the respondents considered it a way of professional self-realization, and 62% of the respondents considered it a way of providing an acceptable income. As a part of global entrepreneurship monitoring (2018–2019), we have concluded that necessity-based entrepreneurship is more common among women. A similar conclusion can be reached based on data that we have obtained (17% of women vs. 11% of men would prefer to do something else if they chose).

The monitoring results of the quality of labor potential of the Vologda Oblast population for 2020 indicate that necessity-based entrepreneurship was less common (for instance, only 14.5% would prefer to engage in another activity if they had no choice), especially among young people who consider professional self-realization and ensuring an acceptable financial situation as key motives.

The analysis of opportunity-based and necessity-based entrepreneurs by education level allowed concluding that the population with higher and incomplete higher education more often considers entrepreneurship as the main activity type. At the same time, population with no vocational secondary education has the opposite situation – more than half of them are engaged in entrepreneurship due to the lack of a more suitable job *(Tab. 2)*.

Our findings are consistent with the results of other studies. For example, the work of Alexandrova E.A., Verkhovskaya O.R. indicated that opportunity-based entrepreneurs are characterized by a higher education level and more often than others have a higher education (in 46% of cases) [17, p. 113]. We should note that it is difficult to directly compare the obtained data in this study with our own, as E.A. Alexandrova and O.R. Verkhovskaya made calculations in % of opportunity-based entrepreneurs, while in our work – in the context of education level. Nevertheless, the general conclusions and conclusions in both the first and second cases are identical.

In the context of marital status among those who registered marriage, entrepreneurship was considered as the main activity in more than 90% of cases, as a way of professional self-realization and obtaining an acceptable income – in 76% of individual entrepreneurs. In the social group that was not in a relationship, such statements about entrepreneurship were less common *(Tab. 3)*.

The differences between the selected groups of entrepreneurs may be related not only to socio-demographic characteristics, but also to the perception of work. Most entrepreneurs and self-employed characterize this activity type not only as a way to earn money and feed themselves (family), but also to make a career, realize themselves as a person and achieve success *(Tab. 4)*.

Table 2. Characteristics of individual entrepreneurs or self-employed depending on education level, share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed

Possible answer	Education level		
	Incomplete secondary education; secondary school including vocational school with secondary education	Vocational secondary education (technical school, etc.)	Incomplete higher education (at least 3 university courses); higher education
Share of categories among IE and self-employed, %	*28.6*	*34.3*	*37.1*
Entrepreneurship is my main activity	75.0	68.4	95.8
Entrepreneurship provides me with an acceptable prosperity level	75.0	52.6	70.8
Entrepreneurship allows me to realize myself professionally	75.0	68.4	66.7
I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	58.3	26.3	45.8
If I could chose, I would prefer something else	33.3	10.5	8.3
Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.			

Table 3. Characteristics of individual entrepreneurs or self-employed depending on their marital status, the share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed

Possible answer	Marital status		
	I am in a registered marriage	I am not in a registered marriage, but I live together with my husband (wife)	Divorced; unmarried (single); widow (widower)
Share of categories among IE and self-employed, %	*52.9*	*15.7*	*31.4*
Entrepreneurship is my main activity	93.1	62.5	72.2
Entrepreneurship provides me with an acceptable prosperity level	75.9	50.0	55.6
Entrepreneurship allows me to realize myself professionally	75.9	62.5	61.1
I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	48.3	25.0	38.9
If I could chose, I would prefer something else	13.8	0.0	22.2
Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.			

Table 4. Characteristics of individual entrepreneurs or self-employed depending on perception of work, the share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed (except those who are not sure)

Possible answer	Entrepreneurship is my main activity	Entrepreneurship provides me with an acceptable prosperity level	Entrepreneurship allows me to realize myself professionally	I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	If I could chose, I would prefer something else
Feed oneself (family)					
Absolutely agree + agree	100.0	100.0	100.0	100.0	100.0
Absolutely disagree + disagree	0.0	0.0	0.0	0.0	0.0
Feel safe and secure					
Absolutely agree + agree	88.6	90.6	90.9	89.5	85.7
Absolutely disagree + disagree	11.4	9.4	9.1	10.5	14.3
Earn love					
Absolutely agree + agree	77.1	79.3	80.6	85.0	75.0
Absolutely disagree + disagree	22.9	20.7	19.4	15.0	25.0
Earn respect, recognition					
Absolutely agree + agree	92.1	96.8	97.1	90.9	85.7
Absolutely disagree + disagree	7.9	3.2	2.9	9.1	14.3

End of Table 4

Possible answer	Entrepreneurship is my main activity	Entrepreneurship provides me with an acceptable prosperity level	Entrepreneurship allows me to realize myself professionally	I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	If I could chose, I would prefer something else
Realize oneself as a person					
Absolutely agree + agree	100.0	100.0	100.0	100.0	100.0
Absolutely disagree + disagree	0.0	0.0	0.0	0.0	0.0
Achieve success					
Absolutely agree + agree	100.0	100.0	100.0	100.0	100.0
Absolutely disagree + disagree	0.0	0.0	0.0	0.0	0.0
Earn money					
Absolutely agree + agree	97.7	100.0	100.0	100.0	100.0
Absolutely disagree + disagree	2.3	0.0	0.0	0.0	0.0
Make a career					
Absolutely agree + agree	97.1	100.0	100.0	100.0	100.0
Absolutely disagree + disagree	2.9	0.0	0.0	0.0	0.0
Get moral satisfaction					
Absolutely agree + agree	92.5	97.1	97.2	95.5	75.0
Absolutely disagree + disagree	7.5	2.9	2.8	4.5	25.0
Get new knowledge					
Absolutely agree + agree	90.6	92.6	92.9	88.2	83.3
Absolutely disagree + disagree	9.4	7.4	7.1	11.8	16.7

Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.

It is rather interesting that in a number of parameters (for example, "feed oneself (family)", "earn money", "achieve success", etc.), differences between groups that consider entrepreneurship as the main activity or, on the contrary, prefer to engage in something else if possible, are absent or minimal, but in other indicators (for instance, "earn respect, recognition", "get moral satisfaction", "get new knowledge"), such a difference exists. Moreover, those who consider entrepreneurship as the main activity type demonstrate a greater commitment to positive response options for the indicated parameters.

A similar situation is in relation to professional prospects. When comparing the two extreme groups, the article shows that in the case of replacing entrepreneurship with other activities, population less often assesses their prospects in direction of improving professional skills as "high" and "rather high" (67% vs. 84), a similar situation develops with respect to career growth (57% vs. 81), as well as decent wages. On the contrary, the position is more often voiced according to which professional prospects are characterized as "low" and "rather low". If we consider a group of population in which entrepreneurship is associated with professional self-realization, then its representatives are more likely than others to have such prospects as career growth, professional development, and decent pay *(Tab. 5)*.

According to the parameter associated with preferences, there are no differences between opportunity-based and necessity-based entrepreneurs. Both the former and the latter assign a key role to implementation of their own business at their own risk, while guaranteed, but low income is mentioned less often *(Tab. 6)*.

Table 5. Characteristics of individual entrepreneurs or self-employed depending on professional prospects, the share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed (except those who are not sure)

Possible answer	Entrepreneurship is my main activity	Entrepreneurship provides me with an acceptable prosperity level	Entrepreneurship allows me to realize myself professionally	I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	If I could chose, I would prefer something else
Demand in profession					
High + rather high	97.6	100.0	100.0	95.5	85.7
Rather low +low	2.4	0.0	0.0	4.5	14.3
Professional development					
High + rather high	84.2	86.7	93.9	78.9	66.7
Rather low +low	15.8	13.3	6.1	21.1	33.3
Decent pay					
High + rather high	85.7	91.2	88.9	95.2	66.7
Rather low +low	14.3	8.8	11.1	4.8	33.3
Career development					
High + rather high	80.6	86.2	84.8	83.3	57.1
Rather low +low	19.4	13.8	15.2	16.7	42.9
Self-realization in profession					
High + rather high	90.5	94.1	91.7	90.5	75.0
Rather low +low	9.5	5.9	8.3	9.5	25.0
Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.					

Table 6. Characteristics of individual entrepreneurs or self-employed depending on warranty or risk preferences, the share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed (except those who are not sure)

Possible answer	Entrepreneurship is my main activity	Entrepreneurship provides me with an acceptable prosperity level	Entrepreneurship allows me to realize myself professionally	I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	If I could chose, I would prefer something else
Guarantee, stable, but low income	11.4	13.9	13.2	13.6	16.7
High income, but no guarantee for the future	31.8	30.6	31.6	27.3	33.3
Вести на свой страх и риск собственное дело	56.8	55.6	55.3	59.1	50.0
Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.					

When describing the selected groups of entrepreneurs regarding their readiness for various kinds of actions, we have revealed that entrepreneurs are more focused on reproduction of their intellectual potential. This is expressed in willingness to become highly qualified specialists, to master new knowledge, patterns of behavior, to use new technologies in various spheres of life. Entrepreneurs' propensity to such actions is explained by the fact that global economic development is associated with constant growth and updating of knowledge, support for entrepreneurial initiatives.

Despite the fact that entrepreneurship is recognized as a source of job creation and realization of public goals [1], all the selected groups of entrepreneurs are less likely to be involved in socio-political activities (only one in three is ready for public work or is already engaged in it). The situation is slightly better with entrepreneurs' involvement in implementing social projects to solve local problems. It is worth noting that a greater propensity in this direction is shown by necessity-based entrepreneurs, who, if they can choose another activity, would be more willing to solve social issues compared to those who consider entrepreneurship as the main activity type *(Tab. 7)*.

It is necessary to pay attention to a number of other points. The first is due to the fact that in almost 60% of cases, both those who consider entrepreneurship as their main activity, and those who are engaged in entrepreneurship to improve their financial situation and improve their professional level, do not plan to learn a foreign language. This may be one of the barriers to companies entering foreign markets. The same applies to the unwillingness of entrepreneurs in almost half of cases to change their place of residence, move to territories with more favorable conditions for running their own business.

Foreign works (for example, V. Piazza-Georgi[7]) emphasize that even if there is a "market demand", not everyone is ready to move to another city, learn a new profession and change jobs for a better life. It is the education system that leads to an increase

[7] Piazza-Georgi B. The role of human and social capital in growth: Extending our understanding. *Cambridge Journal of Economics*, 2002, vol. 26, no. 4, pp. 461–479.

Table 7. Characteristics of individual entrepreneurs or self-employed depending on warranty or risk preferences, the share of agreed with the far mentioned statements, % of those who identified themselves as IE or self-employed (except those who are not sure)

Possible answer	Entrepreneurship is my main activity	Entrepreneurship provides me with an acceptable prosperity level	Entrepreneurship allows me to realize myself professionally	I have to engage in entrepreneurship as a cannot find a more decent job (including for hire)	If I could chose, I would prefer something else
Learn new knowledge and skills, develop personally and professionally					
Ready + ready and already implementing	92.9	91.2	91.9	95.0	100.0
Not ready	7.1	8.8	8.1	5.0	0.0
Become a high-class specialist					
Ready + ready and already implementing	88.4	85.7	86.1	85.7	75.0
Not ready	11.6	14.3	13.9	14.3	25.0
Organize own business, family business					
Ready + ready and already implementing	82.5	84.4	85.3	84.2	62.5
Not ready	17.5	15.6	14.7	15.8	37.5
Learn new values, behavior pattern that correspond to modern way of life					
Ready + ready and already implementing	81.8	78.6	81.3	73.3	71.4
Not ready	18.2	21.4	18.8	26.7	28.6
Learn and use new technologies in work and in home					
Ready + ready and already implementing	84.2	83.3	84.8	76.5	75.0
Not ready	15.8	16.7	15.2	23.5	25.0
Engage in creative work activity in the workplace (to make innovative proposals, to participate in creation of something new, etc.)					
Ready + ready and already implementing	73.5	65.4	72.4	53.8	71.4
Not ready	26.5	34.6	27.6	46.2	28.6
Learn a foreign language					
Ready + ready and already implementing	35.3	42.9	41.9	43.8	57.1
Not ready	64.7	57.1	58.1	56.3	42.9
Move to another locality of the country with more attractive working conditions					
Ready + ready and already implementing	48.6	51.9	50.0	50.0	66.7
Not ready	51.4	48.1	50.0	50.0	33.3
Participate in realization of social projects aimed at solving local problems (socialization of disable people, employment of vulnerable groups of citizens, production of environmentally friendly products, improving the quality of life, etc.)					
Ready + ready and already implementing	48.4	48.0	53.8	50.0	71.4
Not ready	51.6	52.0	46.2	50.0	28.6
Engage in social and political activities (participation in the work public organizations, trade unions, political parties, etc.)					
Ready + ready and already implementing	37.1	32.1	42.9	31.3	33.3
Не готов	62.9	67.9	57.1	68.8	66.7
Source: monitoring data of the quality of labor potential of the Vologda Oblast population, VoIRC RAS, 2020.					

in the efficiency of a person in conditions of uncertainty and risk, contrary to the position of entrepreneurial abilities as a kind of natural gift (J. Schumpeter). This is also proved by the results of the international PISA study which demonstrates education contribution to increasing population's entrepreneurial activity[8].

Although the importance of entrepreneurial education is recognized, it remains the subject of sharp criticism. In particular, the forms of its development are not sufficiently effective, existing developments in the field of human capital are not taken into account, and the focus is on individual programs, rather than the mass level[9]. However, in some countries, such as France, entrepreneurial skills are considered universal and mandatory at the school level. In other cases, attention to the entrepreneurial component remains insufficient and formal which requires changes in the countries' educational policy to take into account the ongoing changes.

Despite the identified problematic points, the paper shows that entrepreneurs are distinguished by a tendency to run their own business at their own risk, as opposed to a focus on obtaining stable, but low incomes; among the main motives is the perception of their activities from the position of not only earning money, but also realizing their potential and achieving success in life. Along with the above, an important role for different groups of entrepreneurs is given to the reproduction of their intellectual potential (professional development, professional training, development of new values and behavior patterns). Similar conclusions are drawn in the work of P.L. Glukhikh, L.V. Voronina, and A.V. Ivanova[10]. Among the main qualities inherent in young people, they note mobility, activity and creativity, the desire to get education, improve skills, career value, and positive attitude to entrepreneurship.

Conclusion

The research shows the role of entrepreneurship in ensuring territories' economic development, defines the parameters to distinguish two types of entrepreneurship – necessity-based and opportunity-based. The author have identified the groups of factors that influence the prevalence of these types of entrepreneurship (in one case, it is macroeconomic stability, institutions, infrastructure, etc., in the other – for technological improvement, higher education, vocational training, effective markets). Along with it, the paper pays attention to other aspects that determine the prevalence of opportunity-based and necessity-based entrepreneurship (in the second case, for example, poor financial situation, dissatisfaction with working conditions, opportunities for professional growth). Opportunity-based and necessity-based entrepreneurship is identified from the standpoint of socio-demographic aspects, as well as aspects related to the perception of their activities (self-realization, success, moral satisfaction), with potential realization, and willingness to improve in a professional direction.

The study demonstrates that regardless of which of the selected groups an entrepreneur belongs to, they are characterized by a tendency to run their own business at their own risk, in contrast to the focus on obtaining stable, but low incomes; among the main motives that affect their activity is the

[8] Hafer R.W., Jones G. Are entrepreneurship and cognitive skills related? Some international evidence. *Small Business Economics,* 2015, vol. 44, no. 2, pp. 283–298.

[9] Oosterbeek H., Van Praag M., Ijsselstein A. The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review,* 2010, vol. 54, no. 3, pp. 442–454; Martin B.C., McNally J.J., Kay M.J. Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing,* 2013, vol. 28, no. 2, pp. 211–224; Neck H.M., Greene P.G. Entrepreneurship education: Known worlds and new frontiers. *Journal of Small Business Management*, 2011, vol. 49, no. 1, pp. 55–70.

[10] Glukhikh P.L., Voronina L.V., Ivanova A.V. *Entrepreneurial Culture of Youth and Factors of Its Development: a Sociocultural Approach.* Upravlenets, 2016, no. 3 (61), pp. 52–61.

perception of their activity from the position of not only earning money, but also realizing the potential and achieving success in life. Along with the far mentioned, an important role for different groups of entrepreneurs is given to reproduction of their intellectual potential (professional development, professional training, and development of new values and patterns of behavior). Another common feature for the selected groups of entrepreneurs is their low involvement in both socio-political activities in general and in implementation of social projects. The aspects are the key features of entrepreneurial activity.

Along with the general features, there are also differences that relate to different prevalence of the selected groups of entrepreneurs. The author shows that voluntary entrepreneurship has become more widespread, while only 12% of necessity-based entrepreneurs would prefer another direction of activity if they do not have a choice. Population's propensity to engage in a particular type of entrepreneurship also differs depending on socio-demographic characteristics. It is worth noting that among entrepreneurs in general, population over 30 years old prevailed. Among the opportunity-based entrepreneurs who consider this activity type as the main one, population with higher and incomplete higher education was more common, in the case of necessity-based entrepreneurship, on the contrary, secondary special education was widespread. In the context of marital status among voluntary entrepreneurs, those who are in a registered marriage were more common, the opposite situation is typical for necessity-based entrepreneurs (people who are not in a relationship are more often represented in this group).

The paper proves that the difference between necessity-based and opportunity-based entrepreneurs is associated not only with socio-demographic characteristics, but also with the perception of their activities. For opportunity-based entrepreneurs, who consider entrepreneurship as the main activity type, to a greater extent than necessity-based ones, its perception is characterized from the position of focusing on earning respect and recognition, gaining new knowledge, and realizing their potential. In addition, they are more likely to rate their prospects for professional development, career growth and professional improvement higher. Thus, opportunity-based entrepreneurs can act as a group that accumulates intellectual potential in order to subsequently realize it for creating and spreading innovations.

The scientific novelty and practical significance of the research consists in identifying groups of opportunity-based and necessity-based entrepreneurs, their characteristics, analyzing the prevalence of these types of entrepreneurship at the regional level, determining common and distinctive features in their perception of their activities (from the point of view of achieving success, realizing oneself, etc.), assessing professional prospects, as well as readiness for certain actions.

In turn, the latter creates prerequisites for the authorities in terms of creating conditions for each of groups of entrepreneurs, determining the most powerful and effective incentives for activating their potential.

We should emphasize that the policy regarding the support of different groups of entrepreneurs should be differentiated. Some of the measures should be general in nature and apply to all enterprises, while regional authorities should provide a block of directions taking into account the type of entrepreneurship. Special attention in the conditions of crisis phenomena in the economy should be paid to necessity-based entrepreneurs because this group is more responsive to changes in the external socio-economic environment: the prevalence of crisis phenomena in the economy is accompanied by reduction in production, and after that, the staff. In the current situation, some of the measures include tax breaks, state provision

of loans for enterprises, provision of deferred payments for the lease of commercial real estate, support in the field of logistics and customs. It can also be a moratorium on bankruptcy and specialized measures aimed at supporting individual industries[11]. These measures and a number of other areas will help support business sector in unfavorable socio-economic conditions.

References

1. Linan F., Rodríguez-Cohard J.C., Rueda-Cantuche J.M. Factors affecting entrepreneurial intention levels. In: *45th Congress of the European Regional Science Association "Land Use and Water Management in a Sustainable Network Society"*. 2005, August 23–27th. 19 p.
2. Zemtsov S.P., Smelov Yu.A. Factors of regional development in Russia: Geography, human capital and regional policies. *Zhurnal Novoi ekonomicheskoi assotsiatsii=The Journal of the New Economic Association*, 2018, no. 4 (40), pp. 84–108 (in Russian).
3. Zemtsov S.P. Institutions, entrepreneurship, and regional development in Russia. *Zhurnal Novoi ekonomicheskoi assotsiatsii=The Journal of the New Economic Association*, 2020, no. 2 (46), pp. 168–180 (in Russian).
4. Antonova M.P. et al. *Razvitie malogo i srednego predprinimatel'stva v Rossii v kontekste realizatsii natsional'nogo proekta* [Development of Small and Medium-Sized Businesses in Russia in the Context of the National Project Implementation]. Moscow: Izdatel'skii dom «Delo» RANKhiGS, 2020.
5. Barinova V.A., Zemtsov S.P., Tsareva Yu.V. Small and medium-sized businesses in Russia and the regions in 2019–2020. In: *Rossiiskaya ekonomika v 2019 godu. Tendentsii i perspektivy* [Russian Economy in 2019. Trends and Prospects]. Iss. 41. Moscow: Izdatel'stvo Instituta Gaidara, 2020. Pp. 279–290 (in Russian).
6. Smirnova A.A. Measures of state support for small businesses during the COVID-19 pandemic in Russia. *Ekonomika, predprinimatel'stvo i pravo=Journal of Economics, Entrepreneurship and Law*, 2021, vol. 11, no. 2, pp. 285–298 (in Russian).
7. Chepurenko A.Yu., Yakovlev A.A. A theory of entrepreneurship: The importance of context. *Rossiiskii zhurnal menedzhmenta=Russian Management Journal*, 2013, vol. 11, no. 2, pp. 51–60 (in Russian).
8. Acs Z. How is entrepreneurship good for economic growth? *Innovations,* 2006, vol. 1, no. 1, pp. 97–107.
9. Shane S.A. *The Illusions of Entrepreneurship: The Costly Myths that Entrepreneurs, Investors, and Policy Makers Live by*. New Haven, CT, Yale University Press, 2008.
10. Stenholm P., Acs Z.J., Wuebker R. Exploring country-level institutional arrangements on the rate and type of entrepreneurial activity. *Journal of Business Venturing*, 2013, vol. 28, no. 1, pp. 176–193.
11. Shevchenko L.I. The concept of entrepreneurial activity, its economic and legal essence. *Zakonodatel'stvo =Legislation*, 2006, no. 11, pp. 33–40 (in Russian).
12. Ustinova K.A. A socio-demographic image of a modern entrepreneur. *Problemy razvitiya territorii=Problems of Territory's Development*, 2018, no. 4 (96), pp. 124–135 (in Russian).
13. Akimova O.E. Motivational foundations of entrepreneurship in Russia. *Problemnyi analiz i gosudarstvenno-upravlencheskoe proektirovanie=Problem Analysis and Public Administration Projection*, 2013, no. 1, pp. 131–138 (in Russian).
14. Chepurenko A.Yu. Early entrepreneurship in Russia: Interim GEM results. *Mir Rossii=Universe of Russia*, 2008, no. 2, pp. 22–40 (in Russian).
15. Williams C.C. Beyond necessity-driven versus opportunity-driven entrepreneurship: A study of informal entrepreneurs in England, Russia and Ukraine. *The International Journal of Entrepreneurship and Innovation,* 2008, vol. 9, no. 3, pp. 157–165.

[11] Business support measures and practical recommendations for companies in the pandemic context. Available at: https://roscongress.org/materials/mery-podderzhki-biznesa-i-prakticheskie-rekomendatsii-dlya-kompaniy-v-usloviyakh-pandemii/

16. Zazdravnykh E.A. Theoretical analysis of the relationship between entrepreneurs' preferences and innovation activity. *Zhurnal ekonomicheskoi teorii=Russian Journal of Economic Theory*, 2017, no. 2, pp. 122–131 (in Russian).
17. Aleksandrova E.A., Verkhovskaya O.R. Motivation of entrepreneurial activity: The role of institutional environment. *Vestnik SPbGU=Vestnik of Saint Petersburg University. Management*, 2016, no. 3, pp. 107–138 (in Russian).
18. Verkhovskaya O.R., Dorokhina M.V. Activity and potential of the Russian entrepreneurship (evidence from global entrepreneurship monitor data, 2006–2011). *Vestnik S.-Peterb. un-ta=Vestnik of Saint Petersburg University. Management*, 2011, no. 4, pp. 68–99 (in Russian).
19. Zemtsov S.P., Baburin V.L. Entrepreneurial ecosystems in the Russian regions. *Regional'nye issledovaniya =Regional Studies*, 2019, no. 2 (46), pp. 4–14 (in Russian).
20. Ustinova K.A., Gubanova E.S., Leonidova G.V. *Chelovecheskii kapital v innovatsionnoi ekonomike: monografiya* [Human Capital in an Innovative Economy: Monograph]. Vologda: ISEDT RAS, 2015. 195 p.

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Cluster Analysis of the Dynamics of the Birth Rate of Fourth and Subsequent Children in Russian Regions*

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Abstract. The article presents results of the research in the differentiation of Russian subjects by birth rate of fourth and subsequent children, depending on the region's socio-economic development level for the period of 2005–2017. The authors conduct cluster analysis based on Ward's method of time series of 3 groups of indicators, particularly demographic, economic and social, in the regional context. As a result, they identify 6 clusters, describing the situation of Russian subjects, depending on the values of the birth rate of fourth and subsequent children and indicators of socio-economic development of the region for 2005–2017. The study reveals that in the period under review there are two main trends: first, transition of RF subjects from Cluster 1, characterized by sufficiently high values of the birth rate of fourth and

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subsequent children and low indicators of socio-economic development, to the clusters with a lower value of the coefficient and higher indicators of socio-economic development; second, transition of RF subjects from the clusters with a low birth rate of fourth and subsequent children to the clusters characterized by the increased birth rate against the background of improved socio-economic development. In the current period, it is possible to distinguish the formation of two poles of large families – these are "the poor with many children" regions, in which a high birth rate of fourth and subsequent children is associated with low socio-economic development, and "the rich with many children" regions with high birth rates and a high level of socio-economic development. Between them there are other RF subjects, which are gradually moving away from the pole of "the poor with many children", but have not approached the pole of "the rich with many children" yet. The novelty of the study lies in the application of the author's approach to the analysis of relationship between large families and socio-economic development of Russian regions in the temporal dimension.

Key words: birth rate, crude birth rate, birth rate of fourth and subsequent children, cluster analysis, having many children, socioi economic situation, subjects of the Russian Federation.

Introduction

In recent decades, the birth rate problem in Russia is critical and attracts attention of a wide range of specialists. Despite the 15-year active pro-natalist policy, the crude birth rate (CBR) has been declining in the Russian Federation since 2016[1]. There remains regional differentiation of the birth rate: the CBR value varies from 1.12 in the Leningrad Oblast to 2.97 in the Tyva Republic (according to the 2018 data)[2]. For the constituent entities and the country as a whole, the CBR differs in birth order significantly [1]. Though the number of births of first and second children is decreasing, the birth rate of third and subsequent children by birth order is growing quite steadily in relation to the previous period; the number of large families and the number of children in them are also going up [1].

The influence of regional socio-economic differences on the birth rate of first and subsequent children (including multi-child parenting) is quite complex and contradictory. The results of econometric modeling based on the dynamic series of panel data for RF subjects show that the significance of individual factors impact varies both for birth order coefficients and individual coefficients in dynamics [1]. The study is aimed at trying to cluster RF subjects by birth rate of fourth and subsequent children, depending on the socio-economic conditions in the period of 2005–2017. Its scientific novelty consists in the elaborated comprehensive approach to the analysis of fertility processes: first, the birth of fourth and subsequent children is a study object, second, the relationship between the birth of fourth and subsequent children and the socio-economic state of regions is considered, and third, the dynamics of its changes is evaluated.

Methodological approaches to clustering in the studies of socio-demographic processes

First, it should be noted that clustering birth rate-related processes is based on analyzing the impact, which various socially and historically determined factors have on them. Studies devoted to this problem are quite numerous [2], but their results are contradictory [1]. When determining a birth rate, the influence of various factors, such as economic, demographic, social, socio-cultural,

[1] Demographic results of the first half of 2019 in Russia (part I). Available at: http://www.demoscope.ru/weekly/2019/0823/barom05.php (accessed February 12, 2020).

[2] *Ibidem.*

and socio-psychological, is considered. They can be divided into macro-and micro- level factors. The macro-level factors are the following: GDP per capita, consumer confidence index [3], quality of life indicators [4], average per capita monetary income of the population, average monthly salary, per capita fixed capital investment, number of doctors of all specialties, average provision of housing for the population [5], number of women of reproductive age, etc. Micro-factors include characteristics of household, such income level [6], parents' education level, presence of a partner, availability of work for parents [7] , etc.

The analysis of regional differentiation is based on the ideas of spatial demography. In the modern period, its methodology has significantly expanded due to the use of a number of spatial analytics methods: spatial econometrics, geographically weighted regression, multi-level modeling, and spatial structure analysis. For example, the GWR (Geographically Weighted Regression) method allows us to study dynamic models of spatial and temporal clustering.

Spatial analysis is used to study differences in the course of demographic processes both between countries and between regions of one state. For instance, I. Mietule, I. Maksymova, and K. Holikova, having made cluster analysis, described the impact of dynamic changes inherent in the socio-demographic and economic characteristics of some European countries on business and the social sphere in individual clusters, using the example of Latvia and Ukraine [8].

A significant number of works are devoted to the intra-country spatial differentiation of socio-demographic processes. For example, P.J. Boyle, E. Graham, and Z. Feng singled out local birth rate clusters based on factors, such as place of residence, housing market characteristics, and social interaction processes [9].

The researchers I. Salvini, G. Gabrielli, and A. Paterno analyzed the relationship between mortality and birth rates and socio-economic characteristics, using dynamic factor analysis and cluster analysis methods, to describe convergence processes and heterogeneity among the clusters [10]. Cluster analysis was also used, for example, to work out the active demographic policy for the counties of Croatia [11].

Within the framework of spatial demography there appears a temporal dimension, which characterizes the dynamics of changes in the studied indicators in different territories. J. Pénzes, Z.I. Pásztor, and P. Tátrai analyzed databases of the 1980–2011 censuses and revealed spatial imbalances in the demographic characteristics of peripheral settlements and correlations between regional backwardness and population decline [12].

M. Yüceşahin and A. Tulga considered demographic changes and spatial clustering in terms of a qualitative approach (cluster analysis) in the Middle East and North Africa on the basis of selected demographic indicators for 1950, 1980 and 2015. One of the conclusions of this study is that MENA countries represent three different structures in different time periods in terms of demography, and these structures are responsible for regional social, economic, and political transformations [13].

In recent years, cluster analysis has also been widely used in Russian socio-demographic studies. A number of works are devoted to the cluster analysis of Russian regions, where the study objects are as such: level of human capital development [14], social potential of the region [15], socio-demographic situation (GRP, life expectancy, migration, morbidity and unemployment[3]), demographic behavior [16], demographic potential [17], birth and mortality rates of the population [18], functioning of healthcare systems [19] , etc.

[3] Gladyshev A.V. *Statistical analysis of the socio-demographic situation in the Siberian Federal District: Candidate of Economic Sciences Dissertation Abstract.* Moscow, 2005. 22 p.

Demographers, when applying the cluster approach, deal with at least two main methodological issues – identification of indicators and selection of the clustering method.

The variety of clustering methods used in demographic studies is significant. Clustering algorithms are divided into two categories: hierarchical and non-hierarchical. The results of hierarchical algorithms are presented in the form of a dendrogram – a tree diagram that shows in what order the objects are divided into clusters. Hierarchical algorithms, in turn, make up two groups: agglomerative and divisive [20]. Cumbersome nature of calculations is a disadvantage of hierarchical procedures.

In modern economic and demographic studies researchers often use the K-means method to obtain unbiased estimates for a large number of observation units [21] and the EM clustering algorithm to build data models using a linear combination of multidimensional normal distributions [15]. Popular geodemographic analysis algorithms include fuzzy geographically weighted clustering (FGWC) and its modification based on the ABC optimization scheme (FGWC-ABC) [22]. The fuzzy clustering algorithm has been recently gaining popularity, as well as a number of its modifications (fuzzy geographically weighted clustering, intuitionistic fuzzy geographically weighted clustering (MIPFGWC), Kernel Fuzzy Geographically Clustering (KFGC)) [23]. For example, fuzzy clusterization was used in the study of analysis of demographic potential of Russian regions [24] and effectiveness of regional healthcare systems [25].

Materials and methods

To analyze regional convergence of large families, we conducted clustering of RF subjects, based on the assessment of territorial differentiation of the indicator of the birth rate of fourth and subsequent children and the level of socio-economic development of the regions from 2005 to 2017. The choice of the basic variable was determined by a number of prerequisites. First, it is the "diversity" of modern ideas about the content of multi-child parenting: if classically a large family meant having five or more children, at present, within the framework of the Russian state's social policy, the boundary has shifted towards families with fewer children (three or more). Second, the impact of state support measures to encourage the birth of third children (implemented first at the regional, then at the federal level) on the birth rate has not been fully studied. Accordingly, the birth rate of fourth and subsequent children was chosen for the study, as it, on the one hand, characterizes a large number of children and, on the other hand, is to a lesser extent influenced by the state policy.

For clustering, we used indicators that can be divided into three groups. The choice of variables was determined, first, by the need to take into account various groups of factors, such as demographic, economic and social; second, by the availability of time series of statistical data for the selected indicators. As a result, the following indicators were used as regressors (explanatory variables):

1) economic – real per capita monetary income according to regional PPP, rubles per month, nominal GRP per capita, rubles per year, unemployment rate, share of the population with income below subsistence minimum, R/P 10% ratio (social stratification degree);

2) demographic – marriage rate, life expectancy at birth, migration growth, urban population share, divorce rate, number of abortions per 100 births;

3) social (infrastructure) – total area of residential premises per inhabitant, square meters, population per hospital bed, coverage of children with preschool education, Human Development Index.

To solve the tasks, we used official statistics data for Russian regions for 2005–2017. At the beginning of the study period, 45 regions were included in the sample. This is due to the lack of statistical data on the birth of fourth and subsequent children in other RF subjects. Then, as more data became available, the sample was replenished, and as of 2017 it comprised 85 regions of the Russian Federation. Besides, in the study we consider that the Arkhangelsk Oblasts includes Nenets Autonomous Okrug, and the Tyumen Oblast includes Khanty-Mansi and Yamalo-Nenets autonomous okrugs.

Still it is rather controversial to include regions in the sample, when the necessary statistical information on them becomes available. The analysis of scientific literature shows that this issue was practically not considered in previous works. The authors avoid this problem by truncating the sample by number of regions and by time. For example, in the work of O.M. Shubat and I.V. Shmarova [24], the database of 77 RF subjects for 2012–2015 was used. A.M. Ilyshev and A.P. Bagirov [25] conducted clustering of regions by level and factors of reproductive activity based on the 2006 data alone.

It should be noted that the issue of cluster dynamics (the transition of regions of the original cluster to another and the process of formation and identification of new clusters) is practically not studied in scientific literature. As a rule, clusters are represented by a static group of regions that are not subject to changes. For example, in the work of N.P. Tikhomirov and T.M. Tikhomirova [26], the regions were grouped into three homogeneous clusters, the composition of which did not change in the study period (2000–2019). In addition, several subjects were classified as "non-typical regions". Unfortunately, the authors did not provide a detailed explanation of this measure. In our opinion, the issue of cluster dynamics makes it possible to more accurately differentiate regional demographic policy measures. The fact of the transition of a region from one cluster to another, as well as the analysis of the factors ensuring such a transformation, is of considerable scientific interest and may be the object of further research. To solve this methodological problem, we conducted cluster analysis in two variants. The first variant included calculations for 45 regions in the dynamics from 2005 to 2017. In the second variant, the calculations were carried out for 85 RF subjects, as they were included in the sample based on the availability of data.

Statistical processing was performed using hierarchical cluster analysis according to Ward's method in Stata 15 application software package. This approach to clustering was first proposed by J.H. Ward [27]. The attractiveness of hierarchical cluster analysis for our study is due to the program's capability to independently determine the number of clusters to break down. The difference between Ward's method and other cluster analysis methods is that methods of variance analysis are used to estimate the distances between clusters. The distance between clusters is taken as the increase in the sum of squares of the distances of objects to the cluster center, obtained as a result of their union. That is, there is a merger of clusters, the union of which gives the smallest increase in intra-cluster dispersion, i.e., to the greatest extent leads to "loosening" of the clusters identified in the previous steps of the procedure. Thus, the clustering (joining) algorithm according to Ward's method includes four stages.

1. An average value of individual variables for objects included in the cluster is calculated.

2. Squared Euclidean distances between individual observations of each cluster and the average cluster value are calculated.

3. Received values are summed up.

4. Observations are grouped into clusters in such a way that the reduction in the total sum of the distances between the clusters is the smallest.

Results and discussions

In the course of calculations based on the sample of 45 regions, for which there are data for all years of the study period, 5 main clusters were identified *(Table 1)*. In the calculations involving 85 regions of the Russian Federation, 6 clusters were identified *(Table 2)*. The final distribution of regions by cluster is presented in *Table 3*. The selected clusters show the relationship between the birth rate of fourth and subsequent children and the socio-economic situation of the regions that changes in the period under review. Thus, the transitions of regions from one cluster to another are tracked over time.

Cluster 1. It is characterized by a relatively high birth rate of fourth and subsequent children and the lowest indicators of socio-economic development. In particular, there is the lowest value of average per capita income and GRP per capita, while the maximum average value of the poverty and unemployment level. It also has the smallest share of urban population. The number of regions in Cluster 1 gradually decreased from 40 to 3 in 2005–2013. Moreover, the regions not only moved from less "prosperous" clusters to more "prosperous" ones, but there was also a reverse movement – 14 subjects in 2016 and 12 regions in 2017 were again assigned to Cluster 1. The analysis of primary statistical information on the regions that made such a return allowed us to conclude that the main reason for it was a noticeable decrease in the level of real incomes of the population, observed from 2015 to 2017. The Samara Oblast is one of the most striking representatives of this group of regions: the population's real income decreased by 25% (from 14.1 to 10.5 thousand rubles at 2005 prices) in 2013–2017. At the same time, the birth rate of fourth and subsequent children showed a steady increase (from 0.046 to 0.062).

Cluster 2. In comparison with the previous cluster, in Cluster 2 the birth rate of fourth and subsequent children is lower, and the values of socio-economic indicators are higher. Average monetary income in this cluster in the first version

Table 1. Characteristics of clusters according to convergence of large families in Russian regions based on the analysis of 45 regions (2005–2017)

Variable	Average variable value by cluster				
	1	2	3	4	5
Birth rate of fourth and subsequent children	0.06488	0.06056	0.06331	0.06965	0.08533
Real monetary income by regional PPP, rubles per month	7 662	8 802	9 762	11 195	11 782
Nominal GRP per capita, rubles per year	152 369	162 941	228 583	336 077	517 927
Unemployment rate, %	7.6	6.9	6.2	5.7	5.7
Share of the population with income below subsistence minimum, %	20.4	15.6	14	12.6	13.2
Housing provision, sq. m per capita	22.9	23.2	24.2	24.8	24.9
R/P 10% ratio	11.5	12.8	13.3	13.9	14.2
Population per hospital bed, people	99.9	102.4	106.7	111.5	110.9
Coverage of children with preschool education, % of the number of children aged 1-6	60.8	62.8	65.9	69.2	72.1
Marriage rate	7.5	8.0	8.2	8.2	8.3
Life expectancy at birth, years	67.8	68.3	69	69.7	70.7
Migration growth, thousand people	-3.6	-6.0	-0.17	14	-5.0
Human Development Index	0.78	0.80	0.82	0.84	0.87
Percentage of urban population	66.2	70.2	72.1	74.7	77.7
Divorce rate	4.12	5.62	4.80	4.84	4.80
Number of abortions per 100 births, units	93.1	85.2	73.7	60.0	56.6
Calculated on the basis of the data from the Federal State Statistics Service of the Russian Federation.					

Table 2. Characteristics of clusters according to convergence of large families in 85 RF regions

Variable	Average variable value by cluster					
	1	2	3	4	5	6
Birth rate of fourth and subsequent children	0.095	0.084	0.071	0.079	0.101	0.194
Real monetary income by regional PPP, rubles per month	7 285	9 107	10 010	11 137	13 655	17 007
Nominal GRP per capita, rubles per year	94 752	182 605	268 030	418 157	1 280 278	5 115 483
Unemployment rate, %	10.3	7.3	6.0	5.7	4.5	5.6
Share of the population with income below subsistence minimum, %	21.4	15.9	13.7	13.2	10.9	7.8
Housing provision, sq. m per capita	21.2	23.4	25.0	25.2	23.9	24.2
R/P 10% ratio	11.8	12.9	13.2	13.6	14.7	16.6
Population per hospital bed, people	100.9	105.96	108.2	113.2	96.5	115.8
Coverage of children with preschool education, % of the number of children aged 1-6	55.7	62.6	67.6	70.7	74.7	78.0
Marriage rate	7.7	7.9	8.1	8.0	8.2	8.3
Life expectancy at birth, years	67.6	69.1	69.6	70.4	69.5	72.1
Migration growth, thousand people	-15.5	-10.0	-1.1	3.7	-22.2	-59.0
Human Development Index	0.77	0.81	0.84	0.86	0.89	0.89
Percentage of urban population	63.5	67.2	72.8	75.3	82.6	78.2
Divorce rate	4.0	4.5	4.8	4.7	5.3	4.6
Number of abortions per 100 births, units	94.1	71.2	64.0	56.5	67.1	56.5
Calculated on the basis of the data from the Federal State Statistics Service of the Russian Federation.						

of the calculations (see Table 1) amounts to 8,802 rubles, which is by 1,260 rubles (13%) higher than in Cluster 1, and rates of unemployment and poverty are lower – 6.93 and 15.6%, respectively. It is important to note a significantly lower average number of abortions (85.2 per 100 births). At the beginning of the period under analysis, the cluster included 9 regions with relatively high socio-economic indicators. In the period from 2006 to 2014, the cluster was replenished with subjects included in the sample for the first time, for example, regions of the Central Federal District (Vladimir, Lipetsk, Ryazan, Smolensk oblasts, etc.). In addition, regions from Cluster 1 were transferred to Cluster 2 due to the changes in socio-economic and demographic indicators. In 2012, Cluster 2 consisted of 17 regions that were in Cluster 1 at the beginning of the study period. The largest number of subjects in this cluster was in 2012–2013 (29), after which it gradually decreased due to the transition of regions to Cluster 3. In 2017, 10 regions remained in Cluster 2 (see Table 3).

Table 3. Distribution of RF subjects by cluster*

RF subject	Cluster membership												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Central Federal District													
Belgorod Oblast	1	1	2	3	3	3	4	4	4	4	5	5	5
Bryansk Oblast	1	1	1	1	1	1	2	2	2	2	3	3	3
Vladimir Oblast	no data	no data	no data	no data	no data	no data	2	2	2	3	3	3	3
Voronezh Oblast	1	1	1	1	1	2	3	3	3	3	4	4	4

Continuation of Table 3

RF subject	Cluster membership												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ivanovo Oblast	1	1	1	1	1	1	1	1	2	2	2	2	2
Kaluga Oblast	1	1	1	2	2	2	3	3	3	4	4	4	4
Kostroma Oblast	1	1	1	1	1	2	2	3	3	3	3	3	3
Kursk Oblast	1	1	1	2	2	2	3	3	3	3	3	4	4
Lipetsk Oblast	1	2	2	3	2	3	3	3	3	4	4	4	4
Moscow Oblast	1	2	2	3	3	3	3	4	4	4	4	5	5
Orel Oblast	1	1	1	1	1	2	2	2	3	3	3	3	3
Ryazan Oblast	no data	no data	no data	no data	no data	no data	no data	2	3	3	3	3	4
Smolensk Oblast	no data	no data	no data	no data	no data	no data	no data	2	2	3	3	3	3
Tambov Oblast	no data	no data	no data	no data	no data	no data	no data	2	2	2	3	3	3
Tver Oblast	no data	no data	no data	no data	no data	no data	no data	no data	2	2	3	3	3
Tula Oblast	1	1	1	2	2	2	2	3	3	3	4	4	4
Yaroslavl Oblast	1	1	2	2	2	2	3	3	3	3	4	4	4
Moscow	no data	no data	no data	no data	no data	no data	no data	no data	5	5	5	5	5
Northwestern Federal District													
Republic of Karelia	**1**	**1**	**2**	2	2	2	3	3	3	3	4	4	4
Komi Republic	2	3	3	4	4	4	5	5	5	5	5	5	5
Arkhangelsk Oblast	1	2	3	3	3	3	4	4	4	5	5	5	5
Nenets AO	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	6	6
Vologda Oblast	no data	no data	no data	no data	no data	no data	no data	3	3	4	4	4	4
Kaliningrad Oblast	no data	no data	no data	no data	no data	2	3	3	3	4	4	4	4
Leningrad Oblast	1	2	2	3	3	3	4	4	4	4	5	5	5
Murmansk Oblast	2	2	3	3	3	3	4	4	4	4	5	5	5
Novgorod Oblast	1	1	1	2	2	3	3	3	3	4	4	4	5
Pskov Oblast	1	1	1	1	1	1	2	2	2	2	3	3	3
Saint-Petersburg	2	2	3	3	3	4	4	5	5	5	5	5	5
Central Federal District													
Republic of Adygea	1	1	1	1	1	1	1	2	2	2	3	3	3
Republic of Kalmykia	1	1	1	1	1	1	1	1	2	2	2	3	3
Republic of Crimea	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
Krasnodar Krai	no data	no data	no data	no data	no data	no data	no data	3	3	4	4	4	4
Astrakhan Oblast	1	1	no data	no data	no data	2	2	2	3	3	4	4	4
Volgograd Oblast	1	1	1	2	2	2	2	3	3	3	3	3	3
Rostov Oblast	no data	no data	no data	no data	no data	no data	2	2	2	3	3	3	4
Sevastopol	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data

Continuation of Table 3

RF subject	Cluster membership												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
North Caucasian Federal District													
Republic of Dagestan	1	1	1	1	1	1	1	1	2	2	2	2	3
Republic of Ingushetia	1	no data	1	1	no data	no data	no data	1	1	1	1	1	1
Kabardino-Balkarian Republic	no data	no data	no data	1	1	1	1	1	1	2	2	2	2
Karachay-Cherkess Republic	no data	no data	no data	no data	1	1	1	1	2	2	2	2	2
Republic of North Ossetia	no data	no data	no data	no data	no data	no data	no data	2	2	2	2	2	2
Chechen Republic	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
Stavropol Krai	1	1	1	1	1	1	2	2	2	3	3	3	3
Volga Federal District													
Republic of Bashkortostan	1	2	2	2	2	3	3	3	3	4	4	4	1
Mari El Republic	1	1	1	1	1	2	2	3	3	3	3	1	1
Republic of Mordovia	1	1	1	1	2	2	2	3	3	3	3	1	2
Republic of Tatarstan	2	3	3	3	3	4	4	4	4	5	5	5	4
Udmurt Republic	1	2	2	2	3	3	3	3	4	4	4	1	1
Chuvash Republic	1	1	1	1	2	2	2	2	3	3	3	1	1
Perm Oblast	no data	no data	no data	no data	no data	no data	no data	4	4	4	4	4	4
Kirov Oblast	1	1	1	1	2	2	2	2	3	3	3	1	1
Nizhny Novgorod Oblast	no data	no data	2	2	no data	2	3	3	3	3	4	4	4
Orenburg Oblast	no data	no data	no data	no data	no data	2	3	3	4	4	4	4	4
Penza Oblast	1	1	1	1	2	2	3	3	3	3	3	1	2
Samara Oblast	2	3	2	3	3	3	4	4	4	4	4	1	1
Saratov Oblast	no data	no data	no data	no data	no data	no data	2	2	2	2	3	3	3
Ulyanovsk Oblast	1	1	1	2	2	2	3	3	3	3	3	1	1
Ural Federal District													
Kurgan Oblast	no data	no data	1	1	no data	no data	no data	2	2	2	2	2	3
Sverdlovsk Oblast	no data	no data	no data	no data	no data	3	3	4	4	4	4	4	4
Tyumen Oblast without AO	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
Khanty-Mansi Autonomous Okrug	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	5	5
Yamalo-Nenets Autonomous Okrug	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	6	6
Chelyabinsk Oblast	2	2	2	2	3	3	3	3	4	4	4	1	1
Siberian Federal District													
Altai Republic	no data	no data	no data	no data	no data	no data	no data	2	2	2	2	2	2
Tyva Republic	no data	no data	no data	no data	no data	no data	1	1	1	2	2	2	2
Republic of Khakassia	1	2	2	2	3	3	3	3	4	4	4	2	3

End of Table 3

RF subject	Cluster membership												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Altai Krai	1	1	no data	no data	no data	no data	no data	2	2	2	2	2	2
Krasnoyarsk Oblast	3	3	3	4	4	4	5	5	5	5	5	1	1
Irkutsk Oblast	1	1	no data	no data	no data	no data	no data	3	4	4	4	4	4
Kemerovo Oblast	2	3	2	3	3	3	3	3	3	4	4	1	1
Novosibirsk Oblast	2	2	2	2	3	3	3	4	4	4	4	1	1
Omsk Oblast	2	2	2	2	3	3	3	3	4	4	4	2	2
Tomsk Oblast	3	3	3	3	4	4	4	4	5	5	5	2	3
Far Eastern Federal District													
Republic of Buryatia	no data	no data	no data	no data	no data	no data	no data	2	2	2	2	2	2
Republic of Sakha (Yakutia)	3	3	4	4	4	5	5	5	5	5	5	1	1
Zabaykalsky Krai	no data	no data	no data	no data	no data	no data	no data	2	2	2	2	2	2
Kamchatka Krai	no data	no data	no data	no data	no data	no data	no data	4	4	4	4	4	4
Primorsky Krai	1	2	2	3	3	3	3	4	4	4	4	1	2
Khabarovsk Krai	no data	no data	2	2	2	3	3	4	4	4	4	4	4
Amur Oblast	1	2	2	3	3	3	3	3	4	4	4	4	4
Magadan Oblast	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	5	5
Sakhalin Oblast	no data	no data	no data	no data	no data	no data	5	5	5	5	5	5	5
Jewish Autonomous Oblast	no data	no data	no data	no data	2	2	2	3	2	3	3	3	4
Chukotka Autonomous Okrug	no data	no data	no data	no data	no data	no data	no data	5	5	5	5	5	5

* The distribution by cluster is presented in accordance with the available data on the birth rates of fourth and subsequent children in RF subjects.
Source: authors' calculations.

Cluster 3. It is characterized by the lowest average birth rate of fourth and subsequent children and the positive dynamics of socio-economic indicators in comparison with the previous clusters: real monetary income in the first variant is 9,762 rubles, in the second – 10,010 rubles, the unemployment rate accounts to 6.9 and 6.0%, respectively, the poverty rate – 14.0 and 13.7%, housing provision – 24.2 and 25.0 sq.m. Besides, the coverage of population with preschool education is going up. Cluster 3 was formed only in 2007 due to the changes in the socio-economic and demographic situation in RF subjects, as well as the inclusion of new regions in the sample. It comprised the Komi Republic, the Murmansk Oblast, Saint Petersburg and Krasnoyarsk Krai during the transition from Cluster 2. The Republic of Sakha (Yakutia) was included in the sample for the first time in 2007 and was also assigned to Cluster 3 based on the results of clustering. Then it was gradually expanded up to 2014 due to the transition of regions from Cluster 2. Its gradual, not-significant reduction has begun since 2015 (16 regions in 2017).

Cluster 4. This cluster is a turning point in some sense. The birth rate of fourth and subsequent children is gradually increasing and socio-economic indicators are improving: population's

real monetary income in the first variant amounts to 11,195 rubles, in the second – 11,137 rubles, the unemployment rate accounts for 5.7% in both variants, the poverty rate – 12.6 and 13.2%, respectively, and housing provision – 24.8 and 25.2 sq. m. In addition, the regions of this cluster alone show a positive migration increase and a minimum number of abortions per 100 births. The cluster formation began in 2010, and up to 2014 it expanded mainly due to changes in the socio-economic and demographic indicators of the studied regions (Komi Republic, Saint Petersburg, Krasnoyarsk Krai and Republic of Sakha (Yakutia)). Then, it gradually included regions from Cluster 3, as well as subjects, considered in the sample for the first time (Perm Krai and Kamchatka Krai). In 2014–2015, a steep growth of the cluster was recorded due to the transition of regions from Cluster 3. As a result, Cluster 4, comprising 28 regions, has become predominant by the end of the period under review.

Cluster 5. In Cluster 5 the trend that has appeared in Cluster 4 continues: there is a significant increase in the birth rate of fourth and subsequent children (in the second version of the calculations, it is 0.101, i.e. more than 25% higher than the Cluster 4 value), as well as a notable rise in socio-economic well-being: real monetary income in the first version is 11,782 rubles, in the second – 13,655 rubles, the unemployment rate is 5.7 and 4.5% (the lowest indicator among all clusters); and the poverty rate is 13.2 and 10.9%. This cluster has the largest share of urban population (82.6%). Cluster 5 emerged only in 2012 and expanded by including additional regions (Moscow, Khanty-Mansi Autonomous Okrug and Magadan Oblast) in the research database. In 2017, it comprised 13 regions.

Cluster 6. It is the smallest cluster (two regions only), sharply distinguished by the high birth rate of fourth and subsequent children (0.194), which is 92% higher than in Cluster 5. Cluster 6 also has high indicators of economic development: per capita monetary income amounts to 17,007 rubles, and the poverty rate is 7.8%. Nevertheless, there is also the highest migration outflow of the population – 59 thousand people. The cluster was formed only in 2016 due to the inclusion of additional regions (Nenets and Yamalo-Nenets autonomous okrugs) in the sample.

As a result, we can notice high dynamics of transitions of RF subjects between clusters in the period under review. Relatively high rates of economic development in Russia in 2005–2009 led to the transition of most regions from Cluster 1 to Cluster 2, characterized by a lower birth rate of fourth and subsequent children and higher indicators of socio-economic development. It should also be noted that the formation of Cluster 3 has begun since 2008, continuing the trend of moving from Cluster 1 to Cluster 2, with a decrease in the average birth rate of fourth and subsequent children to 0.071 and an increase in the values of socio-economic indicators. In 2008, Cluster 4 appeared (republics of Komi and Sakha (Yakutia)). We can say that it became a turning point in terms of demographics due to a rising birth rate of fourth and subsequent children and growing values of socio-economic indicators. From 2009 to 2017, most RF regions moved to Cluster 4.

In 2011, Cluster 5 (Sakhalin Oblast, since 2012 – Chukotka Autonomous Okrug) was formed. Possibly these regions could have previously been singled out into a separate cluster, but the earliest data on the birth rate of fourth and subsequent children appeared only in these years. There is a similar situation with Khanty-Mansi and Nenets autonomous okrugs, which joined Cluster 6 in 2016 (there are no data on these regions for earlier years).

It should be noted that out of 15 regions representing clusters 5 and 6 in 2017, only the Republic of Sakha (Yakutia) fell into this group as a result of development. According to the first observations results, it was assigned to Cluster 3, then, in 2008–2015 – to Cluster 4, and in 2016 –

to Cluster 5. The rest 14 regions were immediately placed in clusters 5 and 6, as soon as the necessary information on the birth of fourth and subsequent children appeared.

Conclusions

The cluster analysis allowed us to identify key trends in the regional differentiation of Russian large families based on birth rates of fourth and subsequent children and indicators of regions' socio-economic development. First, it is a decrease in the birth rate of many children with a one-time increase in the well-being of regions, which is confirmed by the dynamics of transition of RF subjects from Cluster 1 to clusters 2 and 3 in the studied period. Second, it is a trend associated with a rise in the birth rate of fourth and subsequent children with a simultaneous increase in well-being – transitions from Cluster 3 to clusters 4 and 5. It is necessary to note different intensity of this process. Many regions on this path made only one transition in 2012–2017: for example, the Ivanovo Oblast – from Cluster 1 to the subsequent one, the Tomsk Oblast – from Cluster 3 to Cluster 4. A number of subjects of the Russian Federation moved past two clusters. The transition from Cluster 1 to Cluster 3, characterized by grown welfare and a declined birth rate of fourth and subsequent children, was observed in 10 regions (Republics of Kalmykia and Mordovia, Kostroma, Orel, Pskov, Volgograd, Penza, Saratov and Kurgan oblasts, Stavropol Krai). In six subjects during the period under review we recorded growth of well-being, decline in the birth rate first and then its growth – these are transitions from Cluster 2 to Cluster 4 (republics of Komi and Tatarstan, Murmansk, Samara and Novosibirsk oblasts) and from Cluster 2 to Cluster 5 (Saint Petersburg). Only a small number of regions remained unchanged: Ingushetia remained in Cluster 1, while 3 Russian regions (republics of North Ossetia and Altai, and Altai Krai) remained in Cluster 2. Interesting were the results that showed the reverse movement of regions – from Cluster 1 to clusters 2 and 3, and then again to Cluster 1 (republics of Bashkortostan, Mari El, Udmurtia, and Chuvashia, Kirov and Ulyanovsk oblasts).

As a result, we get the following configuration of regional differentiation of large families and regions' socio-economic development: two extreme fairly stable "poles" – "the poor with many children" and "the rich with many children", between which there are other RF subjects, gradually shifting from the pole of "the poor with many children", but not yet approaching "the rich with many children". The regions with a high birth rate of fourth and subsequent children and low values of indicators of socio-economic development can be classified as "the poor with many children", while regions with high birth rates and high indicators of socio-economic development can be classified as "the rich with many children". As of 2017, the "pole" of "the poor with many children" includes 22 RF subjects from clusters 1 and 2: all the regions of the Caucasus, republics of Bashkortostan, Buryatia, Tyva, Chuvashia, and Altai, as well as a number of regions of the "middle zone" of Russia (Kirov, Ivanovo, and Ulyanovsk oblasts, etc.). The second group of "the rich with many children" consists of Russian regions belonging to clusters 5 and 6, including Moscow, Saint Petersburg, Moscow and Leningrad oblasts, as well as a number of regions of Siberia and the Far East (Khanty-Mansi and Yamalo-Nenets autonomous okrugs, Republic of Sakha (Yakutia), etc.).

The results obtained, in our opinion, refute several existing stereotypes about large families in Russia – its predominance among "poor" segments of the population and in rural areas. The study shows that the birth rate of fourth and subsequent children in 2017 was higher in the subjects of the Russian Federation with higher indicators of socio-economic development, where most population lives in cities. Accordingly, the efforts of state policy to increase the birth rate should be aimed

at moving from the model of large families with an "unplanned" nature of births, characteristic of low-income population groups [28], to the "conscious" and "planned" one. To do this, it is necessary to create a favorable life situation in which it becomes possible to implement "high" reproductive attitudes of Russian women. In this regard, increasing real incomes of the population, raising the level of socio-economic development of the regions located in clusters 3 and 4, which have capacity to move towards the pole of "the rich with many children", come to the fore.

References

1. Trynov A.V., Kostina S.N., Bannykh G.A. Examination of socio-economic determinants of fertility based on the regional panel data analysis. *Ekonomika regiona=Economy of Region*, 2020, vol. 16, no. 3, pp. 807–819. DOI: 10.17059/ekon.reg.2020-3-10 (in Russian).
2. Arkhangel'skii V.N. *Faktory rozhdaemosti* [Fertility Factors]. Moscow: TEIS, 2006. 399 p.
3. Bagirova A.P. *Rozhdaemost' i roditel'stvo v Rossii: determinanty i regional'naya differentsiatsiya: monografiya* [Fertility and Parenthood in Russia: Determinants and Regional Differentiation: Monograph]. Under general editorship of A.P. Bagirova. Yekaterinburg: Izd-vo Ural. un-ta, 2018. 157 p.
4. Istomina K.S. Impact of indicators on the birth rate in the regions. *Vestnik nauki i obrazovaniya= Bulletin of Science and Education*, 2015, vol. 4, no. 2 (4), pp. 60–63 (in Russian).
5. Koreva O.V., Boitsova T.E. Analysis and evaluation of the impact of individual factors on the state of the modern demographic situation in the Russian Federation. *Vestnik evraziiskoi nauki=The Eurasian Scientific Journal*, 2013, vol. 19, no. 6, pp. 47–59. (In Russian).
6. Sukneva S.A., Barashkova A.S., Postnikova K.Yu. Birth rate, number of children and family income: trends and relationships. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 2020, vol. 13, no. 2, pp. 201–213. DOI: 10.15838/esc.2020.2.68.13 (in Russian).
7. Zhuravleva T.L., Gavrilova Ya.A. Analysis of fertility determinants in Russia: What do RLMS data say? *Ekonomicheskii zhurnal VShE=HSE Economic Journal*, 2017, vol. 21, no. 1, pp. 145–187 (in Russian).
8. Mietule I., Maksymova I., Holikova K. Modern socio-demographic trends affecting the business sector of the economies of Latvia and Ukraine. In: *Society. Integration. Education. Proceedings of the International Scientific Conference*. 2018. Vol. 6. Pp. 353–365.
9. Boyle P.J., Graham E., Feng Z. *Contextualising Demography: The Significance of Local Clusters of Fertility in Scotland*. Max Planck Institute for Demographic Research, Rostock, Germany, 2007. DOI: 10.4054/MPIDR-WP-2007-036
10. Salvini M.S., Gabrielli G., Paterno A., Corazziari I. Demographic trends in developing countries: convergence or divergence processes? In: *Corazziar Disia Working Paper*. 2015. No. 03. Available at: https://local.disia.unifi.it/wp_disia/2015/wp_disia_2 (accessed: November 10, 2020).
11. Jurun E., Ujević I. A cluster analysis of Croatian counties as the base for an active demographic policy. *Croatian Operational Research Review*, 2017, vol. 8, no. 1, pp. 221–236. DOI: https://doi.org/10.17535/crorr.2017.0014. Available at: https://hrcak.srce.hr/181659
12. Pénzes J., Pásztor I.Z., Tátrai P. Demographic processes in developmentally peripheral areas of Hungary. *Stanovnistvo*, 2015, vol. 53, no. 2, pp. 87–111. DOI: 10.2298/STNV1502087P
13. Yüceşahin M., Tulga A. Demographic and social change in the middle East and North Africa: Processes, spatial patterns, and outcomes. *Population Horizons*, 2017, vol. 14, no. 2, pp. 47–60. DOI:10.1515/pophzn-2017-0003/
14. Petrykina I.N. Cluster analysis of regions of the Central Federal District in terms of human capital development. *Vestnik VGU. Seriya: Ekonomika i upravlenie=Proceedings of Voronezh State University. Series: Economics and Management*, 2013, no. 1, pp. 72–80 (in Russian).
15. Filipova A.G., Es'kova A.V., Inzartsev A.V. Social potential of a region: Experience of using cluster analysis. *Regionologiya=Russian Journal of Regional Studies*, 2017, vol. 100, no. 3, pp. 438–455 (in Russian).

16. Kanishchev V.V Cluster analysis of demographic behavior of the rural population of European Russia at the beginning of the 20th century and at the beginning of the 21st century. On raising the question. *Ineternum= Ineternum*, 2011, no. 1, pp. 43–55 (in Russian).
17. Shubat O.M., Bagirova A.P., Akishev A.A. Methodology for analyzing the demographic potential of Russian regions using fuzzy clustering. *Ekonomika regiona=Economy of Region*, 2019, vol. 15, no. 1, pp. 178–190. DOI: 10.17059/2019-1-14 (in Russian).
18. Golubova T.N., Makhkamova Z.R., Ovsyannikova N.M. Cluster analysis of birth and mortality rates in the Republic of Crimea. *Nauchnye vedomosti. Seriya: Meditsina. Farmatsiya=Belgorod State University Scientific bulletin. Medicine. Pharmacy*, 2016, vol. 34, no. 12, pp. 88–94 (in Russian).
19. Russkikh T.N., Tinyakova V.I., Stroev S.P. Typologization of Russian regions by efficiency level of health care systems using fuzzy clustering procedures. *Uchet i statistika= Accounting and Statistics*, 2017, vol. 47, no. 3, pp. 43–52 (in Russian).
20. Dolgodvorova E.V. Cluster analysis: Basic concepts and algorithms. *Voprosy nauki i obrazovaniya=Questions of Science and Education*, 2018, vol. 19, no. 9, pp. 73–76 (in Russian).
21. Kovanova E.S. Cluster analysis in handling the problem of typology of regions of Russia by level and intensity of internal labor migration. *Vestnik NGUEU= Vestnik NSUEM,* 2013, no. 4, pp. 166–175 (in Russian).
22. Wijayanto A.W., Purwarianti A., Son L.H. Fuzzy geographically weighted clustering using artificial bee colony: An efficient geo-demographic analysis algorithm and applications to the analysis of crime behavior in population. *Appl Intell*, 2016, vol. 44, pp. 377–398. DOI:/10.1007/s10489-015-0705-7
23. Le Hoang Son. A novel kernel fuzzy clustering algorithm for geo-demographic analysis. *Inf. Sci*, 2015, vol. 317, pp. 202–223. DOI: 10.1016/j.ins.2015.04.050
24. Shubat O.M., Shmarova I.V. Cluster Analysis as an Analytical Tool of Population Policy. *Ekonomika regiona=Economy of Region*, 2017, vol. 13, no. 4, pp. 1175–1183 (in Russian).
25. Ilyshev A.M., Bagirova A.P. Factors of reproductive activity of the population: Analysis of regional differentiation. *Region: ekonomika i sotsiologiya=Region: Economics and Sociology,* 2009, no. 1, pp. 92–110 (in Russian).
26. Tikhomirov N.P., Tikhomirova T.M. Methods of justification for strategies to overcoming demographic crisis in the regions of Russia. *Fundamental'nye issledovaniya=Fundamental research*, 2020, no. 5, pp. 160–166 (in Russian).
27. Ward J.H. Hierarchical grouping to optimize an objective function. *Journal of the American Statistical Association*, 1963, pp. 236–244.
28. Kostina S.N., Zaitseva E.V. Large families models in modern Russian society: The results of narrative interviews. *Sotsiologicheskie issledovaniya=Sociological Studies,* 2021, no. 3, pp. 92–102. DOI: 10.31857/S013216250009563-2 (in Russian).

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Impairment of Assets of the Issuers in the Condition of Economic Crisis – Evidence from the Warsaw Stock Exchange

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Abstract. The main goal of this paper is to examine the impact of on the performed impairment of assets on the market valuation of companies listed on Warsaw Stock Exchange in the conditions of an economic crisis caused by the Covid-19 pandemic. The research undertaken in the project helps recognize the correct behaviour (in the short term) of the issuers' shares in a period of uncertainty and increased volatility of securities prices on capital markets. To this purpose, was adopted a research hypothesis indicating that disclosure of information about the impairment of the company's assets results in negative abnormal returns of their share prices, which was dominant position in the research of previous authors. The research undertaken in the article helps identify the rules of behaviour whether the reaction of investors on updating the company's assets in crisis conditions is different than in times of prosperity. The main hypothesis will be verified using the event study methodology. The author intends to verify whether the level of abnormal returns occurring on the days adjacent to the announcement regarding impairment of assets is significantly different from the average level. The subject of the article will be all reports on impairment of assets submitted by 140 biggest issuers listed on the main trading floor in WSE during the Covid-19 pandemic (year 2020). The effect of the article will be interpretation of certain relationships that characterize the stock exchange in Poland as well as an indication of the importance of the occurrence of impairment of issuers' assets for their share prices in economic crisis situation.

Key words: capital markets, accounting, economic crisis, shares, impairment of assets, event study.

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Introduction

Hundreds of different types of information flow into the capital market every day. Some of them concern the general economic aspects, others refer to changes being introduced in the field of economic or social policy. Another group of messages that reaches investors are those that relate to the direct context of an individual stock exchange issuer. They include recommendations of stock exchange analysts, information on the company's dividend policy (or it changes), share splits or re-splits or insider transactions [1]. This information may cause short-term volatility in the market valuation of issuers.

The information that is sent to investors on a daily basis also includes accounting data from the financial reporting system. Using them to describe the property and capital situation of economic units allows to somehow quantify the results of their economic activity. The external demand for accounting data of an entity may result from some asymmetry of information between managers and other market participants. The latter have a difficult opportunity to assess the profitability of the entity's business, where they want to invest their money. This situation may be caused by the owners' motivation to exaggerate their financial performance. Published accounting data allow external investors to verify the reliability of information coming from high management levels of entities. The correctness of assessments of their activities confirmed by figures enables the proper functioning of the market [2].

Since the 1960s, an attempt has been made to explain the nature of the relationship between accounting data and market valuation of securities of individual issuers. The interpenetration of accounting with capital markets led to the creation of an area of scientific exploration called capital markets research in accounting. The first authors writing in that area attempted to explain the investor's perception of the content of companies' financial results [3] and the immediacy of the market's reaction to its transmission [4]. That area is still being developed by a multitude of scientists conducting research combining accounting with capital markets. In subsequent years, the authors sought more and more relationships between accounting data and the market valuation of listed entities. Attempts have been made to prove the significance of financial results for shaping securities rates only when combined with a regression model based on the least squares method [5]. There was also an increase in investor activity in the periods of quarterly results announcement associated with some underestimation of optimistic forecasts of analysts related to the periodically higher net result [6].

Apart from the above, there is a lot of evidence in the literature that investors use accounting data provided by issuers [7; 8] to make investment decisions. It can be undoubtedly stated that information from the financial reporting system is a factor of variability of securities prices. Investors observing data from the financial reporting system may see more or less profitable entities. Without them, such a situation would not have taken place and there could have been a situation of overstatement of the market valuation of entities that do not perform well and underestimated those whose financial condition remains impeccable.

One of the sources of information affecting on securities prices are reporting changes in the value of issuers assets. This factor may result in the volatility of the issuers' share prices due to the decrease (or increase) in the value of their assets. In this article the author wants to verify how information about change the value of assets affects short-term market valuation of biggest and most liquid issuers listed on the Warsaw Stock Exchange (WSE), which are gruopped in three main indices of polish capital market so called WIG20, mWIG40 and sWIG80 in the economic crisis condition (caused by COVID-19).

To this purpose is necessary to examine the capital market reaction to information relating to reporting of assets impairment by companies listed in the WSE in the form of a current report. Similar topics were the subject of research by few authors [9, 10, 11, 12, 13, 14]. However, they did not focus on the general economic conditions for conducting the analyzes. The author's research contribution to the state of knowledge is an attempt to verify how the market will react to such information in a situation when the specter of a serious economic crisis hangs over it, which was caused by a pandemic of COVID-19 [15]. This paper will present a new approach. Main purpose of this paper is to show how the market will react to such information in a situation where the prices of securities have already discounted a lot of negative information. Such a reaction may be different from that observed in earlier studies.

Despite research on the impairment of assets undertaken i.a. by Polish authors in various cross-sections of this event none of the previous researchers, undertook to verify the link of impairment of assets to the market valuation of stock exchange issuers in the case of economic downturn. Such studies will be undertaken in this article to supplement information in this area.

The main task of the article is to examine the impact of the reported impairment of assets on the market valuation of issuers in crisis condition caused by COVID-19 pandemic. The Author wants to verify whether the disclosure those information in the period of economic downturn will cause similar reaction as in previous topic in this area.

To this purpose, was adopted a research hypothesis indicating that disclosure of information about the impairment of the company's assets during the COVID-19 crisis (year 2020) results in negative abnormal returns (AR) of their share prices, which was dominant position in the previous research. The research undertaken in this article helps identify the rules of behaviour (in the short term) whether the reaction of investors on updating the company's assets in crisis conditions is different than in times of prosperity.

The main hypothesis will be verified using the event study methodology [3, 16]. Author intends to verify whether the level of achieved AR occurring on the days adjacent to the announcement regarding impairment of assets is significantly different from the average level. The subject of the article will be all current reports about impairment of assets submitted by 140 biggest issuers of the main trading floor in polish capital market (WSE) in times of the Covid-19 pandemic (year 2020). Results will be compared with investors reaction on impairment of assets proven in earlier studies.

The conclusions obtained from the statistical verification will allow to arrive at general formulations characterizing the occurrence of impairment of assets in the context of market capitalization of their companies in the „abnormal" conditions of economy functioning.

The effect of the article will be interpretation of certain relationships that characterize the stock exchange in Poland as well as an indication of the importance of the occurrence of impairment of issuers' assets for their share prices in economic crisis situation. The verified hypotheses can be used for development by scientists dealing with methodology of event study and the value of assets in any other capital market in the world.

Impact of assets impairment on the market valuation of issuers during the COVID-19 crisis

Transmission by the issuer of a message indicating that an impairment of assets has been carried out may have a negative effect on the market valuation of its shares, which should result in a decrease in the listing of shares in a given company. This is due to the recognition of a write-offs on the cost, reducing the financial result for the period. Investors receiving such information are reviewing their expectations regarding the company's future profits. As a rule, this involves the sale of its shares on the days following the date of publication of the information regarding the impairment of assets. The

main research question that bothers the author of the paper is, however: „Whether in the conditions of the expected economic downturn resulting in weakening investors' sentiment to risky assets (such as shares) and significant decreases in the market valuation of companies listed on stock exchanges, a similar market response to the fact of providing information on impairment of assets will be observed ?".

Such a dramatic collapse of the economy will lead to mass bankruptcies of enterprises, a decrease in employment and a significant reduction in the standard of living of many people. The vision of the economic crisis caused by the COVID-19 is of great importance for the global financial market. The outbreak was an „black swan" on the stock market, which is an event that has a large impact on investors' decisions that could not have been foreseen [17]. It usually causes serious consequences for the stability of the financial system in the world, and the fact that they cannot be predicted prevents any preparation for its occurrence.

The impact of COVID-19 information on the behavior of stock exchanges has been evident since the end of February 2020. The panic peak fell in mid-March, when the largest global indexes recorded weekly drops exceeding 20% [18]. This bear market did not bypass the WSE. The Warsaw Stock Exchange Index (WIG) set levels not seen since the financial crisis of 2008-2009. Despite the corrective „dead cat bounce" [19], which took place in April, investors' sentiment to investing their funds in slightly more risky assets remained miserable.

From the paper's point of view, it is worth considering how coronavirus will affect the value of assets of listed companies listed on the main floor of WSE. The wide market has recently discounted a lot of negative information. These are included in historically lowest levels of unlisted shares since the years 2011–2012. In connection with this, confirmation in these conditions of the negative impact of asset impairment on the market valuation of companies previously determined on the Polish market [20, 14] is being called into question.

The author of the paper intends to check whether in the year of the spread of „coronavirus crisis" (2020) on the WSE, the above mentioned relationships could be noticed in the days accompanying the announcement of impairment of assets. The author's own research on the impact of the write-offs on the market valuation will allow to deepen the knowledge of capital market participants in the field of short-term determinants of shaping the price of shares of individual issuers in the conditions of economic slowdown.

The paper's effect is to indicate and interpret the relationships that characterize the stock market in Poland as well as to indicate the importance of the occurrence of impairment of issuers' assets for their share prices in times of economic uncertainty resulting in increased volatility of securities prices. The verified hypotheses can be used for further development by scientists dealing with both the methodology of event analysis and the value of assets.

Theoretical aspects of impairment of assets and market valuation of stock exchange issuers

As previously noted, the capital market receives a lot of different kinds of information every day. They may more or less concern individual issuers and influence the prices of their securities. Undoubtedly, one of the factors causing the variability of financial instrument prices is accounting data.

Ray Ball, Phill Brown [3] and William Beaver [4] were mentioned in the introduction as undoubtedly pioneers pointing to the importance of data from the accounting system for the market valuation of stock exchange issuers. Based on the growing popularity of the efficient market hypothesis, in the late 1960s, they attempted to quantify the assessment of the relationship between the reported financial result and the market valuation of entities listed on the American capital market.

The growing interest in the capital market research trend in accounting has led the researchers of stock exchanges to undertake research analyzing

individual elements of accounting data in the context of their relationship with the volatility of securities prices. Nevertheless, the analysis of the price-forming nature of the impairment was undertaken for the first time nearly 20 years later after the start of research in this area.

John Strong and John Meyer [9], moved by the growing number and value of American corporations' reductions in the book value of assets, decided to indicate the importance of impairment write-off for the valuation of securities. Their research was the first to attempt to assess the dependence of impairment by stock exchange entities with the reaction of investors manifested by the volatility of securities prices.

Using the methodology of event study, J. Strong and J. Meyer based on 78 companies from the American stock exchange, which in the years 1981–1985 revealed impairment in their financial statements, have attempted to determine their significance for the market valuation of the shares of these issuers. The 120-day event window they created covered each time 60 session days before and 60 days after the fact of announcing the impairment write-off. Initially, the authors did not find any statistically significant AR in the analyzed event window. However, dividing it into shorter periods made it possible to determine the importance of the impairment write-off for „the increase in the wealth of the company's shareholders". 10 days following the event, the authors recorded statistically significant positive AR, which indicated a positive impact of the reported impairment on the share prices of stock exchange issuers. Moreover, the additional positive impact also occurred before the actual disclosure of information to investors. This could indicate the existence of a certain privileged group of investors making investment decisions before the actual announcement of impairment write-off.

The publication of J. Strong and J. Meyer was a certain motivating factor to verify the conclusions drawn by the authors in the research community. A year later, John Elliott and Wayne Shaw [21] proclaimed the occurrence of lower return on days accompanying the moment of announcing the information about the „large" write-off. Moreover, they noticed that companies reporting significant impairment have lower returns than competitors in the industry not reporting it within 6 months of the impairment write-off announcement. In the following years, an increasing number of authors took up the subject of update of issuers' assets for the market valuation of their securities. In one of them, Howard Bunsis [22] indicated that the market reaction to information announcement is not uniform. Its direction is evidenced by the fact whether the impairment of assets will be related to the expected cash flows. Impairment, accompanied by large negative cash flows, was characterized by a much stronger negative market reaction in relation to write-offs booked only on an accrual basis.

The authors also pointed out the existence of a negative reaction of the market in the case of the announcement of impairment write-off exceeding 1% of the balance sheet total of the issuer [23,24]. It was claimed that the correlation between the amount of the write-off and the return in the short term is not as strong as the correlation between the amount of the write-off and the delayed return. The observed delayed correlation was supposed to indicate some investors' predictions of decreases in prices of goods offered by issuers [25]. It was also noted that the return from companies reporting the impairment depends to a large extent on the timeliness of their disclosure. Moreover, the impairment is made public at a „less appropriate" time compared to the other output elements, resulting in statistically significant volatility of securities prices. [26]. Furthermore, it could be noticed that the market reaction to the write-off (due to goodwill impairment) was also related to the credibility of the explanations of the company's authorities regarding the reasons for the write-off [12].

Methodology of research

Verification of the importance of updating the entity's asset value will be calculated using the event study methodology. It allows to determine the impact of a certain event on the returns of individual securities (in this case shares). Event study, next to simulation methods, is the most commonly used method of confirming semi-strong information efficiency. It is a tool used to react investors to the occurrence of a certain event, which also resulted from its name [27].

Event study methodology has been developed over the years by researchers in the field of finance, which does not exclude the possibility of its application in other areas of social sciences such as management, economics and accounting [28]. This justifies its application for examining the impact of providing information on impairment write-offs on the market valuation of listed entities listed on the WSE during Covid-19 crisis, which are the subject of these considerations.

A milestone in the development of event study methodology was the work of two research teams published in a very similar time. The first concerned the impact of the report containing information on the financial results of listed companies on their market valuation, carried out by Ray Ball and Phillip Brown [3 1968]. While examining the net financial results different from market expectations, they noticed their significant nature for investors. Although the authors themselves claimed that they dealt with the information content of the published periodic report rather than testing the information efficiency, their contribution to the methodology being analyzed is indisputable. There is no doubt that these authors were the first to examine the impact of data from the financial reporting system on shaping securities rates. They also introduced the definition of an AR that is the difference between the actual rate of return achieved that day and the expected rate.

The second publication introducing the event study methodology to global research has been implemented by Eugen Fama's research team. Investigating the wide period of the event, which was information about splits, they attempted to verify the aspiration of stock prices for new information. Thus, they tried to determine the existence of capital market information efficiency. In examining cases of 940 news on the distribution of shares from 1927-1959 in the event window covering 29 months before the information about it and 30 months after they noticed that the market was discounting this message positively. Attempts were made to explain this by rising investors' expectations regarding the future level of dividends.

The event study methodology itself includes several stages that should be carried out in the correct order. These stages should include, first of all, defining the event and its duration (indication of the so-called event window), determining the measures determining level of expected and AR and estimation of the expected rate of return (in the so-called estimation window) using one of its estimation models [29].

The main element needed to conduct an event study is an announcement or event whose new information content may have an impact on future expected cash flows from the issuer's operations or on the discount rate it uses [30]. Importantly, from the point of view of further proceedings, this advertisement must be unexpected by the market. Its earlier signaling would make it possible to include it in prices in line with the effective market hypothesis.

One of the important steps in event study methodology are specifying the event window (in this project, identical to the issuer's submission of a report on the write-off) and an estimation window (used to calculate the expected return) allows to quantify how the market is able to respond to the above-mentioned revision of the asset value.

In the simplest terms, the event window is the time period during which the impact of the event on the market valuation of securities of listed companies is examined. Its length is not constant. It may only cover the day of occurrence of the event, several subsequent trading sessions, or even a period of a year. Analyzing literature, you can find

a distinction between fixed-width and variable-width windows. The use of the first is important especially when conducting research on a large research sample. Possible estimation errors can then compensate each other. However, this situation does not always occur (due to limited access to data, for example), so it is preferable to use variable-length event windows that allow the researcher to adjust its length to each observation individually [31].

Another important element of event study is the definition of the estimation window. It is here that the model parameters (models) are estimated, which will be used to calculate first the expected rate of return on day t, and then the surplus. The expected return is to reflect the „normal" behavior of investors when the market would not receive information about the analyzed event [32]. It is important that it be relatively longer than the event window [33]. The estimation of the expected return takes place in it, which is to determine the shaping of public company securities prices that would have taken place if the event announcement had not been made public. Sudi Sudarsanam [34] pointed to the existence of the seven most commonly used models, which he divided into: single-index, market and portfolio. In this paper will be used one of the market model created by William Sharpe [35] (Sharpe single-index model).

After determining the expected return, a researcher using event study can calculate AR that are at the core of the described methodology. This task is definitely simpler than using one of the above models for estimating the expected return. The AR is the difference between the actual realized return on the day of the event window and the calculated expected return. In the simplest terms, this is illustrated by the following formula:

$$ARit = Rit - E(Rit),$$

where: *ARit* – abnormal return of security *i* in period *t*, *Rit* – realized return of security *i* in period *t*, *E(Rit)* – expected return of security *i* in period *t*.

The AR calculated in this way can be positive, negative or zero. The additional rate mark on day *t* indicates how the event will affect the market valuation of the issuer. In a situation when calculated return is positive, then it can be said that the event examined has a positive effect on the market valuation of the entity being tested, increasing its value. In the opposite case, when the result AR has a negative value, it means that the event was negatively assessed by investors. The market value of the issuer will then fall. The least common case occurs when the additional return is zero. In such a case, it should be assumed that the analyzed event has no impact on the stock exchange price of the tested company [36].

The last of the presented stages of the event study methodology includes an assessment of the statistical significance of the calculated AR. The obtained results may result from the „standard" price volatility recorded on global capital markets. Therefore, it is necessary to adopt the null hypothesis that there is no impact of the event on the formation of security prices, which is characterized by a deficit of statistically significant increase return. The opposite alternative hypothesis is based on the existence of the impact of the information presented about the event on the market valuation of issuers, manifested in statistically significant abnormal returns. In order to verify the truthfulness of any of the indicated hypotheses, appropriate statistical tests are used to check whether the calculated AR are significantly different from zero [30].

According to the research hypothesis adopted in the introduction, the announcement of the write-off will have a negative impact on the market valuation of biggest issuers listed on the WSE. Negative interaction between the indicated variables is expected to manifest itself in the occurrence of negative AR on shares of issuers listed within the WIG20, mWIG40 and sWIG80 indices on the days following the date of announcement of information about the write-off. Moreover, the author wants to verify whether the occurrence of these AR will also take place in the days preceding the day on which the examined information was made available.

Table 1 Issuers listed on the main trading floor of WSE qualified to the research sample (ranked by percentage in the index)

WIG20	mWIG40		sWIG80			
PKOBP	INGBSK	COMARCH	ASSECOSEE	STALEXP	MANGATA	PEKABEX
PZU	KETY	TSGGAMES	ASSECOBS	ABPSL	ZEPAK	ARCTIC
CDPROJEKT	ASSECOPOL	11BIT	MENNICA	SELVITA	PCCROKITA	POLNORD
PEKAO	MILLENIUM	CIECH	ALUMETAL	PBKM	DEBICA	MEDICALG
PKNORLEN	AMREST	ECHO	AGORA	RAINBOW	ASBIS	UNIMOT
KGHM	KRUK	DOMDEV	NEWAG	ATAL	POLIMEXMS	CIGAMES
LPP	KERNEL	FAMUR	WAWEL	CPRGROUP	KRUSZWICA	OAT
SANPL	BUDIMEX	ORBIS	PEP	VIGOSYS	OVOSTAR	TRAKCJA
DINOPL	INTERCARS	AMICA	ENTER	POLICE	WIELTON	EKOEXPORT
CYFRPLSAT	HANDLOWY	CLNPHARMA	APATOR	KOGENERA	R22	VOTUM
LOTOS	GTC	VRG	RYVU	DATAWALK	PGSSOFT	MLSYSTEM
PGNIG	WIRTUALNA	LIVECHAT	SANOK	AMBRA	BIOTON	ULTGAMES
MBANK	EUROCASH	FORTE	NETIA	OPONEO.PL	TOYA	MERCATOR
ORANGEPL	ENERGA	NEUCA	SNIEZKA	TIM	ARHCICOM	RAFAKO
PGE	BENEFIT	PLAYWAY	ACAAUTOGAZ	PHN	TORPOL	SERINUS
PLAY	ENEA	PKPCARGO	BORYSZEW	VOXEL	UNIBEP	ELBUDOWA
CCC	DEVELIA	MABION	FERRO	B0S	ASTARTA	IDEABANK
ALIOR	GRUPAAZOTY	STALPROD	AUTOPARTN	BSCDRUK	MCI	BOOMBIT
TAURONPE	BNPPL	BOGDANKA	MLPGROUP	ATMGRUPA	INSTALKRK	BAHOLDING
JSW	GPW	GETIN	COMP	ELEMENTAL	LENTEX	PRAIRE

Based on: Historical indices portfolios of WSE after annual revision on March 2020. Available at: https://gpwbenchmark.pl/en-notowania (accessed November 18, 2020).

This is to verify whether there is a certain privileged group of investors who have access to confidential information about the impairment.

The author's procedure was taken from the methodology of the first study to verify the significance of impairment on the prices of securities in the 1980s by J. Strong and J. Meyer [9]. He also used the event study methodology for this purpose, which allows to estimate the impact (or lack thereof) of a broadly understood event on the shaping of securities prices.

The hypothesis is to be verified by searching for messages indicating the occurrence of impairment of assets on this account, among the current reports provided by indicated issuers in the Electronic Information Transfer System (ESPI) during the COVID-19 crisis year 2020. The list of companies qualified for the research is presented in *Table 1*.

After obtaining all information regarding impairment of assets in the analyzed period, it will be necessary to group them and chronological order for each issuers. Such prepared reports on the impairment of assets (together with exact dates of their publication) will be the basis for taking quotations of share prices of issuers reporting impairment in the analyzed period. The calculation of daily returns on shares together with the definition of the event window in which the impact of impairment on the market valuation of listed companies will be examined will be another of the author's steps taken as part of the research task. The estimation of AR together with statistical verification of the results will allow for the conclusion regarding the verification of the importance of update of assets due to impairment for the market valuation of issuers in a short-time horizon in economic crisis conditions.

Overall plan of research can be outlined in several steps necessary for their proper conduct. They will be as follows:

• collecting empirical data extracted about impairment of assets in 2020 year from the ESPI;

• construction of a database containing information about the publication of current reports concerning impairment of the assets of biggest issuers listed on the WSE;

• defining the event window in each of the cases where the issuer disclosed information about making an impairment of assets;

• calculation for each event (identical to the passing of information on impairment write-offs) of the expected return based on stock quotations from the estimation window;

• estimation of AR in each event window;

• statistical analysis of calculated average AR (AAR);

• preparation of conclusions regarding the impact of impairment of assets on the market valuation of indicated issuers listed on the WSE.

Event study methodology used in this paper required to fulfill few abovementioned stages. According to them, in order to study the impact of the impairment on the shares of the indicated issuers, the author constructed a symmetrical seven-day event window for each qualified cases to the research sample. It covered three session days preceding the day of publishing the report on the impairment write-off (t_{-3}, t_{-2}, t_{-1}), publication day (t_0) and three session days immediately following the disclosure of the information studied (t_{+1}, t_{+2}, t_{+3}). As in the study of the pioneers of this type of research, the author wanted to verify whether in the days immediately preceding the date of publication of the information on the write-off, there could be statistically significant AR indicating the disclosure of the impairment to a certain privileged group of recipients.

From the point of view of the conducted research, it was important to verify whether in the adopted event window, in each of the qualified announcements about impairment of assets during the COVID-19 year, there are no disruptive events (e.g. information on dividends, analysts' recommendations, block trades, changes in national policy). The occurrence of such a situation may disrupt the cognitive value of the obtained results. The results could not capture the proper significance of the impairment write-off for the market valuation of biggest issuers listed on the WSE during economic crisis, because in the analyzed event window, investors could be more strongly influenced by information with a different content.

Before estimation the AR should be calculated the expected returns. To this case has been used Sharpe single-index model [35]. Model parameters were calculated using the least squares method. Estimation window has been seto to 30 sessions days before the seven-day event window. It started from day t_{-34} to day t_{-5} (in relation to day of announcement the information about impairment of assets on day t_0). The return on the market portfolio was calculated using the WIG quotations (broad market index of WSE).

Last part of research procedure was statistical verification of obtained results. To this have been used non-parametric Wilcoxon matched-pairs test [37] (for AAR in each day of event window) and Cowan Generalized Sign Test [38] (for cumulative abnormal returns – CAR). There are one of the most appropriate tests used to statistical verification of results obtained under event study methodology [39].

Results of conducted research

Reviewing the current reports of the above mentioned companies in the Covid-19 year 2020, 42 announcements with a reference to the write-off were found. They were provided by 26 biggest issuers indicated in *Table 2*.

14 of the previously qualified cases of information being made available, indicating the occurrence of a write-off, was also rejected. Together with this announcement, the issuer has made several other information public. According to the author, it could have had more influence on the behavior of investors than the write-off itself, therefore it was decided to remove this case from the sample.

After a preliminary selection of the impairment write-offs found in 2020 in current reports, it was decided to qualify 28 events to the sample.

Table 2. Information about impairment of assets submitted by biggest issuers listed on the WSE in the form of current reports in 2020

Issuer (WIG20)	Date of current report	Issuer (mWIG40)	Date of current report	Issuer (sWIG80)	Date of current report
ALIOR	07.08.2020	ENEA	27.10.2020	AGORA	30.04.2020
CCC	21.09.2020		11.08.2020		17.01.2020
JSW	28.07.2020		19.05.2020	BAH	07.08.2020
PGE	31.08.2020		14.02.2020	BIOTON	10.04.2020
	13.03.2020	ENERGA	23.07.2020	BOOMBIT	28.02.2020
	14.02.2020		19.05.2020	BORYSZEW	26.05.2020
			08.05.2020		09.03.2020
PGNIG	08.10.2020		31.03.2020	DATAWALK	04.09.2020
					16.11.2020
	12.05.2020	FAMUR	10.02.2020	ELEMENTAL	27.02.2020
	14.02.2020	GRUPAAZOTY	25.03.2020	PEP	30.12.2019
PKNORLEN	04.05.2020			POLNORD	30.06.2020
PZU	25.08.2020			RAFAKO	24.09.2020
TAURONPE	05.08.2020			RAINBOW	27.06.2020
	17.03.2020			SANOK	06.03.2020
	04.03.2020			TRAKCJA	18.03.2020
				ZEPAK	23.09.2020
					26.03.2020

Based on: current reports submitted to ESPI by indicated issuers. Available at: http://infostrefa.com/infostrefa/pl/index/ (accessed December 2020).

Table 3 indicates the companies which made the write-offs in the analyzed period, together with the dates on which such information was made public. It also includes information on which group of assets were impaired and the amount of write-off (with it relations to sum of issuer assets). In the event that the issuer revalued more than one group of assets and it was not possible to indicate which asset was specifically affected, the author decided to create a separate category of write-offs, i.e. „Other".

Next steps of event study methodology consist estimation of expected returns (using Sharpe single-index model) and calculation of AR for each case qualified to research sample. As mentioned above for each qualified current reports about impairment of assets was created seven-day event window. It covered three session days preceding the day of publishing the report on the impairment write-off (t_{-3}, t_{-2}, t_{-1}), publication day (t_0) and three session days immediately following the disclosure of the information studied (t_{+1}, t_{+2}, t_{+3}). In this way were calculated 196 AR. Their values are presented in *Table 4*. The author also added there CAR which is a sum of seven singles AR in event window.

In order to obtain confirmation of the results of the study it was necessary to carry out a statistical tests to verify their significance. To this purpose have been used non-parametric Wilcoxon matched-pairs test for each AAR and Cowan Generalized Sign Test desgined for CAR. Both of them base on the value of Z statistic. Therefore, the author used the assumptions of those tests to check the statistical significance of the calculated AR. Additionally, in table 4 have been put results of statistical verification of AAR and CAR.

As can be read from the table above, the lowest AAR was recorded on the day t_{+1}, which is the next day after a day which news was communicated to the investors about the impairment write-off. Importantly, only on this day and day t_{+3} negative AARs could be recorded (however, on t_{+3} it was much closer to zero). The significantly lower AAR at day t_{+1} may suggest that the market is discounting

Table 3. All qualified cases of current reports about impairment of assets submitted by biggest issuers listed on the WSE in 2020

Issuer	Date of current report	Number of current report	Amount of write-off (in mln PLN)	% of balance sheet total	Group of impaired assets
WIG20					
ALIOR	07.08.2020	37/2020	676	0,87	Other
CCC	21.09.2020	61/2020	448,7	6,65	Other
JSW	28.07.2020	28/2020	431	3,17	Tanginble fixed assets
PGE	31.08.2020	25/2020	1012	1,35	Other
	13.03.2020	10/2020	7100	8,78	Tanginble fixed assets
	14.02.2020	5/2020	79	0,10	Tanginble fixed assets
PGNIG	12.05.2020	18/2020	770	1,34	Tanginble fixed assets
	14.02.2020	6/2020	837	1,46	Other
PZU	25.08.2020	28/2020	1594	0,42	Intangible assets
TAURONPE	05.08.2020	37/2020	227	0,57	Other
	04.03.2020	5/2020	914	2,13	Other
mWIG40					
ENERGA	08.05.2020	39/2020	502	2,33	Other
	31.03.2020	26/2020	340	1,62	Other
ENEA	27.10.2020	47/2020	254	0,81	Long-term investments
	11.08.2020	18/2020	1027	3,29	Tanginble fixed assets
	19.05.2020	6/2020	53	0,17	Long-term investments
GRUPAAZOTY	25.03.2020	17/2020	28,8	0,19	Long-term investments
sWIG80					
AGORA	30.04.2020	20/2020	59,5	3,04	Long-term investments
	17.01.2020	1/2020	11,2	0,56	Long-term investments
BOOMBIT	28.02.2020	6/2020	5,9	0,89	Intangible assets
ELEMENTAL	27.02.2020	26/2020	6,06	0,57	Other
PEP	30.12.2019	40/2019	16	0,65	Long-term investments
POLNORD	30.06.2020	45/2020	52,2	5,20	Tanginble fixed assets
RAFAKO	24.09.2020	50/2020	166,5	12,78	Other
RAINBOW	27.06.2020	25/2020	13,2	2,44	Other
SANOK	06.03.2020	2/2020	41,6	8,85	Long-term investments
TRAKCJA	18.03.2020	8/2020	252,4	17,00	Other
ZEPAK	23.09.2020	45/2020	289	9,27	Tanginble fixed assets

Based on: current reports submitted to ESPI by indicated issuers. Available at: http://infostrefa.com/infostrefa/pl/index/ (accessed December 2020).

Table 4. AR in individual days of the event window for each qualified case of reporting impairment in current reports in the COVID-19 2020 year (in percentage point)

Issuer/ Day of event window	t_{-3}	t_{-2}	t_{-1}	t_0	t_{+1}	t_{+2}	t_{+3}	CAR
ALIOR	3,09%	1,85%	-0,58%	-1,87%	-0,30%	8,14%	-0,52%	9,80%
CCC	-2,81%	-1,66%	5,43%	-0,59%	-6,10%	2,22%	-2,61%	-6,11%
JSW	-2,39%	-0,09%	-2,40%	-3,06%	-9,24%	-3,50%	6,23%	-14,45%
PGE	-3,99%	0,09%	3,12%	-2,63%	-0,14%	1,10%	1,15%	-1,30%
	2,77%	-0,56%	-1,70%	-5,64%	8,16%	11,73%	-1,98%	12,79%
	2,77%	-1,27%	-3,04%	-1,12%	-0,86%	-0,86%	-1,98%	-6,36%
PGNIG	1,53%	-0,84%	-1,13%	0,25%	-0,95%	0,95%	-1,41%	-1,59%
	2,18%	0,53%	0,74%	-0,85%	2,54%	1,04%	0,76%	6,93%
PZU	0,45%	0,52%	0,33%	-0,10%	-1,50%	0,15%	-0,22%	-0,37%
TAURONPE	-2,63%	-2,28%	-0,77%	-5,49%	-1,57%	-3,39%	-1,86%	-17,99%
	0,49%	3,51%	1,05%	-0,47%	-0,93%	2,21%	2,35%	8,20%
ENEA	0,31%	-0,83%	1,40%	-1,27%	5,61%	-2,50%	-1,57%	1,16%
	-2,08%	-0,36%	1,39%	1,86%	-1,07%	0,52%	-2,26%	-2,00%
	1,35%	-0,94%	-0,78%	3,27%	-2,12%	-0,97%	-2,81%	-2,99%
ENERGA	0,26%	-0,90%	1,20%	-1,12%	0,11%	-3,02%	-0,16%	-3,63%
	4,44%	4,47%	-1,09%	2,04%	1,32%	-0,27%	-0,48%	10,44%
GRUPA AZOTY	-5,32%	3,90%	-0,49%	0,21%	-2,34%	-0,20%	-2,33%	-6,57%
AGORA	0,36%	-0,54%	-2,47%	5,93%	2,02%	0,96%	0,50%	6,76%
	8,16%	1,42%	-0,10%	-0,44%	-2,37%	2,32%	-0,62%	8,37%
BOOMBIT	0,06%	3,06%	7,62%	9,23%	9,63%	-16,19%	7,55%	20,97%
ELEMENTAL	-7,53%	4,73%	-6,10%	-1,71%	-16,03%	11,49%	8,10%	-7,05%
PEP	-2,33%	-1,30%	0,23%	-0,60%	-0,86%	2,30%	-1,47%	-4,03%
POLNORD	-1,48%	-2,17%	0,23%	4,80%	-3,14%	-3,04%	-1,06%	-5,87%
RAFAKO	1,70%	1,20%	-0,98%	-0,42%	5,01%	-8,24%	-0,67%	-2,40%
RAINBOW	-0,99%	-3,84%	-2,16%	-7,16%	-4,88%	5,49%	-0,04%	-13,59%
SANOK	-7,75%	2,73%	0,97%	4,64%	2,91%	8,74%	1,41%	13,66%
TRAKCJA	0,42%	11,47%	1,74%	8,16%	-2,85%	1,67%	2,07%	22,68%
ZEPAK	2,40%	-0,45%	0,26%	2,93%	-1,42%	0,23%	-0,37%	3,57%
AAR	-0,23%	0,77%	0,07%	0,31%	-0,76%	0,68%	0,20%	1,04%
Z statistic of Wilcoxon matched-pairs test / Cowan generalized sign test	-0,022	-0,66	-0,154	-1,07	-0,797	-0,956	0,865	0,671

* statistically significance at level $p < 0,05$.
Based on: own calculation based on the share quotations. Available at: https://stooq.pl/t/?i=523, (accessed December.2020).

information about the impairment of the assets of individual issuers. It is surprising that there is no negative AAR on day t_0, when the sharpest sell-off of shares should be expected as a result of such negative news. A more detailed analysis of the timing of providing investors with the 28 current reports selected in the sample shows that the vast majority of issuers submitted such a report after the close of the trading session. The rationale is largely due to the lack of statistically significant negative AARs on the date of disclosure of the asset impairment write-down.

Therefore, it would seem that the negative market reaction observed in the research of previous authors should appear on day t_{+1} and perhaps in the next two events captured in the window. While on the day following the publication of the current report on the impairment of assets, a lower AAR

(-0.76%) can be observed, on the next two days the calculations indicate positive AARs (0.68% on day t_{+2} and 0.20% on day t_{+3}).

From the point of view of the significance of the conducted research on the significance of impairment of assets for the market valuation of companies listed on the WSE during the economic crisis caused by Covid-19, it would be important to verify the obtained AAR values in terms of their statistical significance. For this purpose, the non-parametric tests mentioned above were used. As can be seen the results on any of days of the event window showed no statistical. Despite the clealry lower AAR on the next day the information on the write-off is made public, the non-parametric test applied did not show that the impairment of assets would cause a decrease in the market valuation of the shares of issuers significantly different from that resulting from typical volatility of prices on capital markets. Moreover CAR is also insignifiacnt, which excludes the impact of the write-off on the market valuation of analyzed issuers in the entire event window.

It is also important that in the days preceding the announcement of the analyzed event, no statistically significant rates of return were recorded. This means that it cannot be established that there is a certain group of investors with earlier information on impairment who could make appropriate decisions before the actual disclosure of such information.

Based on the indicated in table 4 AR the obtained results can't confirm the main hypothesis talking about the short-term negative reaction of investors to the information about the impairment of assets during the COVID-19 crisis year 2020.

Conclusions

In the mass of information received daily by the capital markets, accounting data is undoubtedly one of the most important for making investment decisions. In this group one can indicate announcements concerning the financial result achieved, the level of sales achieved, or just announcements concerning the revaluation of assets by the issuer in the form of impairment write-off. The results of many earlier researchers indicate that the announcement of such information is accompanied by a decrease in the market valuation of the issuer.

Main purpose of this paper was an examination the capital market response (on the example of WSE) to information provided by the issuers, in the form of a current report, regarding the impairment of assets in the conditions of the economic crisis. The author's research contribution to the state of knowledge in the field of the implemented paper is an attempt to verify how the market will react to such information in a situation when the specter of a serious economic crisis hangs over it, which was caused by a pandemic of COVID-19 during the 2020 year.

Finding references to the write-off by biggest companies listed on the WSE, 28 cases of write-off announcements were qualified to the final research sample. For each of them, a seven-day symmetrical event window was constructed, covering the day of publishing information about the impairment write-off and three days preceding and following that day. The obtained research results, verified with the non-parametric tests, indicated no statistical significance of the AAR for each of the analyzed days of the event window. Doubts may arise in particular from the lack of a significant difference from zero on the day of the impairment write-off announcement and on the next day, when in the previous study a market should most strongly discount the loss of achievable benefits from the assets involved. Hereby, the hypothesis adopted at the beginning of this study should be rejected. However, the lack of statistically significant abnormal returns on the days following the disclosure of information on impairment of assets allows to indicate a different market reaction in the conditions of the economic crisis caused by COVID-19 as compared to the one observed in previous years.

The tested results show no impact of the impairment of assets on the market valuation of

companies during the COVID-19 crisis year 2020. From a practical point of view, during the economic crisis, investors should not expect a significant decline in the market valuation of issuers announcing an impairment of assets. Thus, they lose some kind of investment opportunity (purchase of cheaper shares), which could have brought them above-average profits.

The author's discrepant results in relation to the previous publication in this field may result from the previous negative sentiment of investors towards risky assets, but also from small research sample. For this reason, steps have been taken to undertake research to verify the behavior of share prices during the economic crisis condition of companies listed on the whole main traiding floor of WSE. The results of the survey conducted on a group of all issuers listed on the WSE will allow more probability to indicate whether (or how) the market responds to information about the impairment of assets during the economic crisis caused by the COVID-19 pandemic. The abovementioned is an important perspective to develop for authors who study capital markets research in accounting.

References

1. Gurgul H. *Analiza Zdarzeń na Rynkach Akcji* [Event Study on the Share Markets]. Wolters Kluwer Business, Warsaw, 2012. 246 p.
2. Wysłocka E. The role of information and financial reporting in the assessment of investment risk. In: *Finanse, Rynki Finansowe, Ubezpieczenia. Scientific Papers by University of Szczecin*, 2013, vol. 61, pp. 605–614.
3. Ball R., Brown P. An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 1968, vol. 6, no. 2, pp. 159–178.
4. Beaver W. The information content of annual earnings announcements. *Journal of Accounting Research*, 1968, no. 6, pp. 67–92.
5. Dimitropoulos P, Asteriou D. Accounting relevance and speculative intensity: Empirical evidence from Greece. *Journal of Applied Accounting Research*, 2010, vol. 11, no. 3, pp. 195–212.
6. Kwag S. A behavioral shift in earnings response after regulation FD. *Journal of Behavioral Finance*, 2014, vol. 15, no. 3, pp. 184–194.
7. Bernartzi S., Michaely R., Thaler R. Do changes in dividends signal the future or the past? *Journal of Finance*, 1997, vol. 52, pp. 1007–1043.
8. Kothari S.P. Capital market research in accounting. *Journal of Accounting and Economics*, 2001, vol. 31, no. 1-3, pp. 105–231.
9. Strong J., Meyer J. Asset writedowns. Management incentives and security returns. *Journal of Finance*, 1987, vol. 42, no. 3, pp. 643–661.
10. Ghicas D., Hevas D., Papadaki A. Fixed assets revaluations and their association with stock returns. *European Accounting Review*, 1996, vol. 5, no. 4, pp. 651–670.
11. Gu F., Lev B. Overpriced shares, ill-advised acquisitions, and goodwill impairment. *Accounting Review*, 2011, no. 86, pp. 1995–2022.
12. Knauer T., Wohrmann A. Market reaction to goodwill impairments. *European Accounting Review*, 2016, vol. 25, no. 3, pp. 421–449.
13. Cheng Y., Peterson D., Sherrill K. Admitting mistakes pays: The long term impact of goodwill impairment write-offs on stock prices. *Journal of Economics & Finance*, 2017, vol. 41, no. 2, pp. 311–329.
14. Lisicki B. Information efficiency of the Warsaw Stock Exchange in the case of impairment of assets. In: Antonowicz P, Galiński P., Pisarewicz P. *Perspektywa Ekonomiczna, Prawna i Finansowa Kreowania Wartości w Gospodarce (Economic, Legal and Financial Perspective of Value Creation in the Economy)*. Gdańsk University Publishing House, Gdańsk, 2020. 395 p. (in Polish).
15. Platje J., Harvey J., Bacchus L. COVID-19 – reflections on the surprise of both an expected and unexpected event. *Central European Review of Economics and Management,* 2020, vol. 4, no. 1, pp. 149–162.
16. Fama E., Fisher L., Jensen M., Roll R. The adjustment of stock prices to new information. *International Economic Review,* 1969, vol. 10, no. 1, pp. 1–21.

17. Taleb N. *The Black Swan: The Impact of the Highly Improbable*. Penguin, Londyn, 2010. 444 p.
18. *Historical Quotations of WIG Index*. Available at: https://stooq.pl/
19. Chen J. *Dead Cat Bounce Definition*. Investopedia, 2019. Available at: https://www.investopedia.com/terms/d/deadcatbounce.asp
20. Lisicki B. Price-generating factor of impairment of non-financial assets on the example of WIG30 companies. *Przedsiębiorczość i Zarządzanie*, 2019, vol. 20, no. 1, issue 1, pp. 273–287 (in Polish).
21. Elliot J.A., Shaw W.H. Write-offs as accounting procedures to manage perceptions. *Journal of Accounting Research,* 1988, vol. 26, pp. 91–119.
22. Bunsis H. A description and market analysis of write-off announcement. *Journal of Business Finance and Accounting,* 1997, vol. 24, no. 9, pp. 1385–1400.
23. Elliot J., Hanna J. Repeated accounting write-offs and the information content of earnings. *Journal of Accounting Research,* 1996, vol. 34, pp. 145–152.
24. Grabiński K. Market reactions to information contained in financial reports: The case of loss of value. *Scientific Papers of University of Economics in Kraków, 2*011, no. 849, pp. 145–159.
25. Alciatore M., Easton P., Spear N. Accounting for the impairment of long-lived assets: Evidence from the petrolelum industry. *Journal of Accounting and Economics,* 2000, vol. 29, no. 2, pp. 151–172.
26. Choi. T. Asset write-offs: An empirical investigation of timeliness. *Asia-Pacific Journal of Accounting & Economics,* 2008, vol. 15, no. 1, pp. 11–28.
27. Fama E. Efficient capital market: A review of theory and empirical work. *Journal of Finance,* 1970, vol. 25, no. 2, pp. 383–417.
28. Geiger M., Lennox C., North D. The hiring of accounting and finance officers from audit firms: How did the market react? *Review of Accounting Studies, 2008 vol. 13, no. 1, pp. 55–86.*
29. Campbell J., Grossman S., Wang J. Trading volume and serial corelation in stock returns. *Quaterly Journal of Economics*, 1997, vol. 108, pp. 905–939.
30. Sorescu A., Warren N., Ertekin L. Event study methodology in the marketing literature: An overview. *Journal of the Academic Marketing Science*, 2017, vol. 45, pp. 186–207.
31. Polak K. Investors' reaction to a published recommendation. *Studia i Materiały*, 2018, vol. 27, no. 2, pp. 127–135 (in Polish).
32. Karasiński J. The influence of date of premiere on stocks rates of return of video games companies listed on the Warsaw Stock Exchange. *Problemy Zarządzania – Management Issues*, 2018, vol. 16, no 3, pp. 82–96 (in Polish).
33. Kujawa S., Ostrowska E. Event study and application in behavioral finance. *Finanse, Rynki Finansowe, Ubezpieczenia*, 2016, vol. 4/2016, no. 2, pp. 191–200 (in Polish).
34. Sudarsanam S. *Creating Value from Mergers and Acquisitions*. Prentice Hall, Harlow, 2003. 616 p.
35. Sharpe W. A simplified model for portfolio analysis. *Management Science,* 1963, vol. 9, no. 2, pp. 277–293.
36. Barber B., Lyon J. Detecting long-run abnormal stock returns. The empirical power and specification of test statistics. *Journal of Financial Economics,* 1997, vol. 43, pp. 341–372.
37. Wilcoxon F. Individual comparisions by ranking methods. *Biometrics Bulletin,* 1945, vol. 1, no. 6, pp. 80–83.
38. Cowan A. Nonparametric event study tests. *Review of Quantitative Finance and Accounting,* vol. 2, no. 4, pp. 344–348.
39. Kurek B. Zawartość *Informacyjna Transakcji Pakietowych na Przykładzie Rynku Głównego Giełdy Papierów Wartościowych w Warszawie* [Information content of block trades on the example of the main market of the Warsaw Stock Exchange]. Publishing House of University of Economics in Kraków, Kraków. 262 p. (in Polish).

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Social Challenges of Modern World (Case Study of the International Research Workshop)

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Social innovations in the modern conditions of the countries' development have acquired a special sound becoming a kind of imperative of the time as a response to growing social, environmental and demographic problems. The contribution of social practices to the growth of inclusion and social justice in society is provided by the expansion of access to public goods for vulnerable social groups and strengthening of civic participation in the life of the country. Social innovations are actively developing in healthcare, social services, education, youth occupation and employment, migration, ecology, transport and mobility issues, energy consumption, etc.

Despite first elaborated attempts for a theory of social innovation, there are still issues related to development and implementation of social innovations in modern society; position of social innovations in terms of improving living standards; their contribution to innovation process of regions

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and countries, to the development of the territories' economy; the problems of creating conditions and favorable environment for development; creation of an ecosystem of social innovations; barriers and drivers of innovation processes; mutual influence of technological and social innovations; interaction of social entrepreneurs with government authorities, representatives of the media, business associations, the scientific community, investors; population willingness to digitalize social practices; potential for using digital social practices; impact of Industry 4.0 on society, etc.

These and other issues were discussed at the 1st International research workshop ***"Social Challenges of Modern World: Actualization of Global and Regional Social Practices"*** on May 18, 2021 conducted by the Vologda Research Center of RAS and the European School of Social Innovation (ESSI).

The workshop was attended by more than 30 scientists from Germany (Dortmund), Spain (Bilbao), Austria (Vienna), Australia (Perth), Russia (Moscow, Yekaterinburg, and Vologda) in the offline and online format, and more than 50 listeners watched the broadcast of the event on the official YouTube channel of the VolRC RAS.

The participants shared the results of their research on the above-mentioned problems, expressed a number of promising areas for studying issues related to the innovative development of regions and countries, and identified points of common scientific interests in this field of research.

After greetings from the organizers of the workshop – the Director of the VolRC RAS, Doc. Sci. (Econ.) ***A.A. Shabunova*** and Managing Director of the European School of Social Innovation (ESSI), Member of Management Board of the Social Research Center of the TU Dortmund University, Senior Researcher ***Antonius Schröder*** – moderator of the meeting, Leading Researcher of the VolRC RAS, Cand. Sci. (Phil.) ***O.V. Tret'yakova*** introduced the participants to how the stated problems are covered on the pages of the academic journal "Economic and Social Changes: Facts, Trends, Forecast" which acted as the information partner of the workshop.

The scientific part was opened by ***A. Schröder*** who outlined the relationship between technological and social innovations. The speaker's presentation emphasized that "any technological or economic innovation is also a social innovation that is decisive, or at least jointly determines the effectiveness and efficiency, success and failure of the innovation". This conclusion was justified by the presented empirical data of a number of projects of the TU Dortmund University combining technological and social innovations: ESSA, SPIRE-SAIS, COCOP, ROBOHARSH. **A. Schröder** outlined the prospects for the study which are caused primarily by the fact that "digital and green transformations require changes in social practices", in particular, "involving stakeholders in the process of joint creativity taking into account economic, social and environmental consequences". According to the speaker, it leads to "more acceptable and efficient technological solutions".

Continuing thought about the new challenges of "digital transformation of society", Deputy Director of the VolRC RAS, Cand. Sci. (Econ.) ***L.V. Babich*** presented to the participants the social practice of the Research and Educational Center for Economics and Information Technologies on the development of a conceptual model of smart competencies of students. The author's model was developed by a team of researchers of the RFBR grant project no. 19-010-00811 "Smart education as a vector of human potential development of the younger generation". The purpose of the project is to promote human potential development of the younger generation in the new digital reality. The model is based on key digital competencies for sustainable education.

The topic of society digitalization was also discussed in a joint report by the scientists of the Center for Studies of Civil Society and the

Nonprofit Sector of the NRU "Higher School of Economics" (Director of the Center, Head of the Department of Economics and Management in NGOs, Can. Sci. (Soc.) ***I.V. Mersiyanova***, Senior Researcher, Can. Sci. (Phil.) ***N.V. Ivanova***, Junior Researcher ***A.S. Bryuhno***). They introduced the participants of the workshop to the first Russian Index of Digital Competencies of NGOs developed in the Center for Studies of Civil Society and the Nonprofit Sector of the NRU "Higher School of Economics". The report concept was based on the "new innovation paradigm" that **A. Schröder** had voiced at the beginning of the workshop, and consisted in considering technological and social innovations as interrelated aspects of a single innovation process. The data obtained on the basis of the Index indicate a weak use of digital technologies by Russian NGOs. In addition, the "digital polarization" of the non-profit sector has intensified during the pandemic. The Index data showed that organizations that had previously used information technology in their activities continued improving their digital competencies, while organizations that had not previously used digital technologies were not ready to implement them during the pandemic. The speakers demonstrated the prospects of the Index of NGOs' Digital Competencies as a tool to diagnose and evaluate innovations in the non-profit sector.

The representatives of the European School of Social Innovation emphasized the relevance of innovation assessment in their speeches. For example, Senior Researcher of the Social Research Center at the TU Dortmund University ***M. Kohlgrüber*** drew the attention to the consequences of mass digitalization, presenting four possible scenarios for future work in digital format and a classification of skills that will be required for work in the future. The scientist's findings are particularly relevant for vulnerable groups (migrants, unemployed, female and elderly workers, as well as people with health problems). To prevent their digital isolation, training providers and employers, according to the speaker, should teach the necessary skills and provide appropriate working conditions that will allow participating in (digital) training and working life. Skills needs must be adapted to regional innovation strategies characterized by specific sectoral and qualification structures, which requires customized training programs.

The logical continuation of the workshop topic was a series of speeches devoted to the problem of the ecosystem of social innovations. The results of an international study on the current state of the social innovation ecosystem were shared by ESSI Scientific Director, Director of the International Research Project Office at the University of Deusto (Spain), and Researcher ***S.A. Caro-González***. She spoke about working out radically new approaches to a single "green", social, techno-digital issues, and stressed the urgent need to accelerate the third, social transition, in addition to green and digital transitions which are more widely recognized by the international community at the present stage. Antonia **Caro-González** noted that "innovation, or the dual transition of European industry to climate neutrality and digital leadership, cannot be sustained without strong, responsive, responsible social and environmental participation"1. Within the framework of the eco-centric society guidelines, the speaker presented 1) radically new tactics for the "how" (green, techno-digital), for the strategic "what" (green, social), for the purposeful "why" (green, social) and for the operational "how best" (green, social, techno-digital), 2) directions for responding to urgent radical challenges. Among these areas, there can be distinguished:

– shift to new (though ancient) principles of eco-centric, rather than ego-centric, behavior.

[1] Caro-Gonzalez, A. (Coord.) et al. (2021) 'The MuskEUteers: The "One for all, All for one'' triple transition – boundaryless green, social, techno-digital innovation'.

– activation of collaborative, responsive, responsible interaction against hierarchy as alternative models of management and distribution to overcome the unfair, unsustainable biased status quo generated by traditional established systems.

– stimulation of the transformative potential of all forms of collaboration (international, interdisciplinary, intersectoral, intergenerational) from the n-helix spectrum.

Senior Researcher of the Department for the Studies of Lifestyles and Standards of Living at the VolRC RAS, Cand. Sci. (Econ.) **A.V. Popov** highlighted the domestic experience of studying the ecosystem of social innovation. He noted the key components of the ecosystem approach to the development of social innovations, demonstrated the features of the social entrepreneurship development in Russia and around the world, and showed the methodological tools of the study on the basis of which there were evaluated the conditions for the development of social innovations in the regions in Russia and their features.

The scientists of the Institute of Economics of the Ural Branch of RAS, Senior Researcher of the Center for Social Economic Theory, Cand. Sci. (Econ.) ***A.Yu.Veretennikova***, and Junior Researcher of the Institute of Economics of the Ural Branch of RAS, graduate student ***K.M. Kozinskaya*** spoke about the modeling of the formal institutional environment and its influence on the social entrepreneurship development. The main leitmotif of their research was the hypothesis that "to develop social innovations, the functioning of appropriate institutions is necessary not only on the part of society, but also on the part of the state". State initiatives have a direct impact on the social entrepreneurship development, both from above – through draft laws and supporting institutions, and from below – by promoting mass initiatives in society. The scientists have found that socially-oriented activities in Russia's regions are distributed unevenly which is caused by the functioning of supportive institutional environment. The research revealed that for Russian regions, the availability of support measures is a more important condition for the development of social innovations than the territory's investment attractiveness.

An essential factor to promote and expanse social innovations in society is the attitude of population itself to them. In the case of specific jobs of a secondary school teacher, Deputy Head of the Department for Editorial-and-Publishing Activity and Science-Information Support of the VolRC RAS, graduate student ***E.A. Kabakova*** showed that in the teaching environment, there is a demand for innovations in the workplace and understanding of the essence of their innovativeness. However, the process of implementing innovations in specific jobs is not carried out as quickly as time requires.

Deputy Director for Research Work of the VolRC RAS, Cand. Sci. (Econ.) ***E.A. Mazilov*** showed the assessment of population readiness as a whole to perceive and use innovations. The idea of population's conservatism in matters of innovation activity, as the study has proved, turned out to be quite fair in relation to the regional community. People are cautious about using new developments preferring to rely on the experience of others. Active use of technologies in everyday life is limited by availability of idle money for acquisition, a lack of need, or a lack of understanding of technologies / the principles of their operation (which generates certain distrust). At the same time, the speaker demonstrated that the region's population is actively interested in the news of science and technology, especially in the areas closest and most understandable to the ordinary person: education, medicine, ecology.

Summing up the results, all participants noted the relevance of the topic, the importance and necessity to discuss the proposed range of issues related to the peculiarities of present and future social development, the problems of interaction between the state and society, current challenges

and threats of modern time, the transformation of the institutional environment, and promising areas of socio-economic policy. According to the Russian scientists, the participants of the meeting, the interesting and magnificent program of the workshop revealed new perspectives and new emphasis in the research analysis of social innovation. It is very important to maintain a dialogue that will help to adequately represent Russian science in the international academic community.

All participants expressed hope for further active cooperation and exchange of research and organizational experience within the framework of the permanent international research workshop ***"Social Challenges of Modern World"***.

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Public Opinion Monitoring of the State of the Russian Society

As in the previous issues, we publish the results of the monitoring of public opinion concerning the state of the Russian society conducted by VolRC RAS in the Vologda Oblast[1].

The following tables show the dynamics of a number of parameters of social well-being and socio-political moods of the region's population based on the results of the last "wave" of monitoring (June 2021) and for the period from August 2020 to June 2021 (last 6 polls).

We compare the results of the surveys with the data for 2000 (the first year of V. Putin's first presidential term), 2007 (the last year of V. Putin's second presidential term, when the assessment of the President's work was the highest), 2011 (the last year of Dmitry Medvedev's presidency), and 2012 (the first year of V. Putin's third presidential term).

We also provide yearly dynamics of the data for 2018–2020[2].

In April – June 2021, the level of approval of the work of the President of the Russian Federation did not change significantly. The share of positive assessments is 52–53%, negative – 30–31%.

The share of negative assessments of the President's work, compared to August 2020, decreased by 4 p.p. (from 34 to 30%). At the same time, the share of positive assessments has not changed significantly (52–53%)[3].

The share of negative assessments of the work of the Chairman of the RF Government decreased by 6 p.p. (from 41 to 35%) for the period from August 2020 to June 2021. The share of positive assessments increased by 3 p.p. (from 39 to 42%).

[1] The polls are held six times a year in Vologda, Cherepovets, and in eight districts of the oblast (Babayevsky District, Velikoustyugsky District, Vozhegodsky District, Gryazovetsky District, Kirillovsky District, Nikolsky District, Tarnogsky District, and Sheksninsky District). The method of the survey is a questionnaire poll by place of residence of respondents. The volume of a sample population is 1,500 people 18 years of age and older. The sample is purposeful and quoted. The representativeness of the sample is ensured by the observance of the proportions between the urban and rural population, the proportions between the inhabitants of settlements of various types (rural communities, small and medium-sized cities), age and sex structure of the Oblast's adult population. Sampling error does not exceed 3%.

More information on the results of VolRC RAS polls is available at: http:// www.vscc.ac.ru/.

[2] In 2020, four "waves" of monitoring were conducted. Surveys in April and June 2020 were not conducted due to quarantine restrictions during the spread of Covid-19.

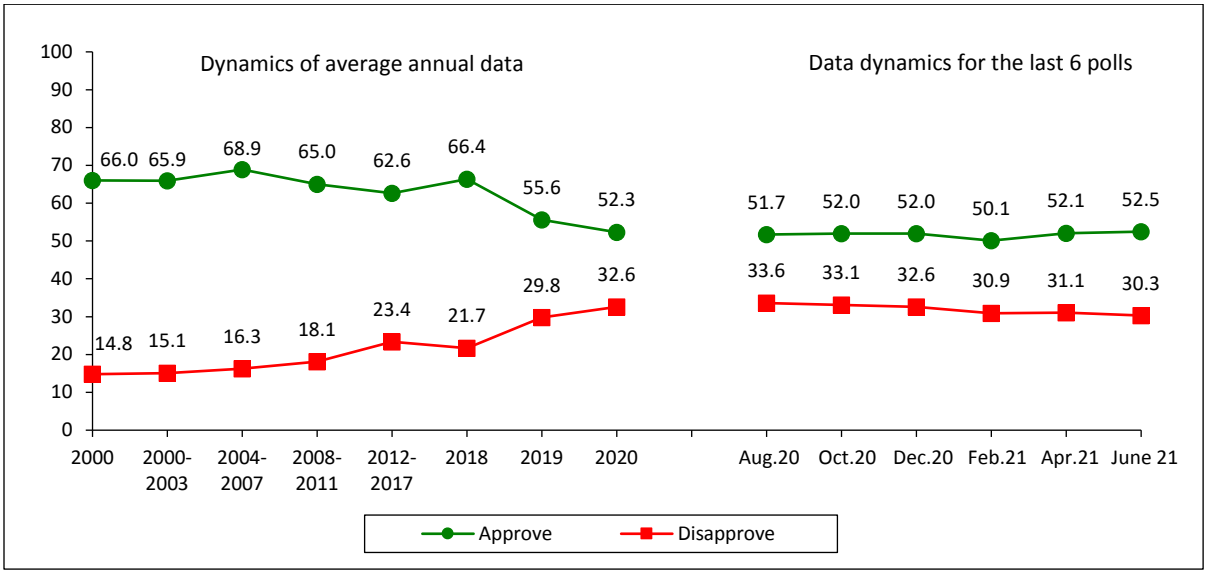
[3] Hereinafter, the results of a comparative analysis of survey data, conducted in April 2021, and the results of a monitoring "wave", conducted in August 2020.

How do you assess the current performance of..? (% of respondents)*

Respond option	Dynamics of average annual data							Data dynamics for the last 6 polls						Dynamics (+/-), Apr. 2021 to Feb. 2020
	2000	2007	2011	2012	2018	2019	2020	Aug. 2020	Oct. 2020	Dec. 2020	Feb. 2021	Apr. 2021	June 2021	
RF President														
I approve	66.0	75.3	58.7	51.7	66.4	55.6	52.3	51.7	52.0	52.0	50.1	52.1	52.5	+1
I disapprove	14.8	11.5	25.5	32.6	21.7	29.8	32.6	33.6	33.1	32.6	30.9	31.1	30.3	-3
Chairman of the RF Government**														
I approve	-**	-**	59.3	49.6	48.0	41.1	38.7	38.9	38.8	39.1	37.6	38.8	42.2	+3
I disapprove	-	-	24.7	33.3	31.6	38.4	40.4	40.9	40.8	38.8	38.8	38.3	35.1	-6
Governor of the Oblast														
I approve	56.1	55.8	45.7	41.9	38.4	35.7	35.0	35.2	35.5	32.9	33.9	36.3	37.8	+3
I disapprove	19.3	22.2	30.5	33.3	37.6	40.2	42.5	41.9	42.1	44.2	42.4	41.3	38.4	-3

* Question: "How do you assess the current performance of…?" According to the research methodology, the sampling error does not exceed 3%, so hereinafter changes with a difference of 2 p.p. are not taken into account or are considered insignificantly; they are highlighted in blue in the tables. Positive changes are highlighted in green, negative changes are highlighted red.
** The question has been asked since 2008.

In general, do you approve or disapprove of the work of the President of Russia?
(% of respondents, FSBIS VolRC RAS data)*



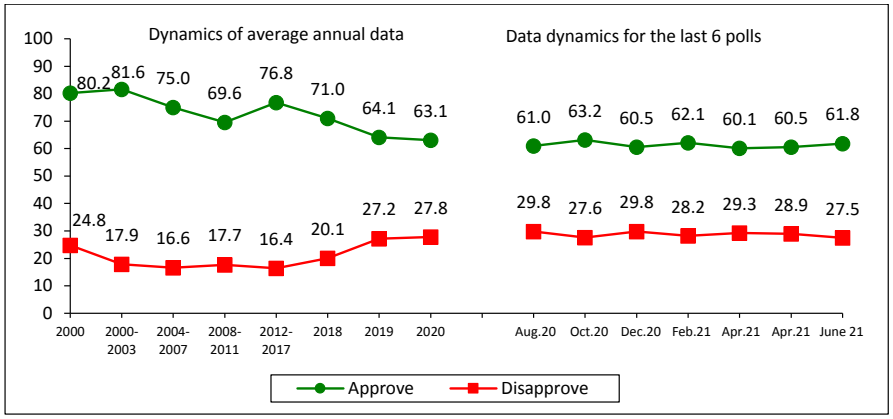
* Hereinafter, all graphs show the average annual data for 2000, 2018, 2019, 2020, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017, corresponding to the periods of presidential terms.

For reference:

According to VCIOM data for April – first half of June 2021, the level of approval of the President's work did not change (60–62%)[4], the share of negative answers was 28–29%.

According to the latest data of the Levada-Center (April – May 2021[5]), the share of positive assessments also did not change (65–67%), negative assessments was 32–33%.

In general, do you approve or disapprove of the work of the President of the Russian Federation? (% of respondents; VCIOM data)*



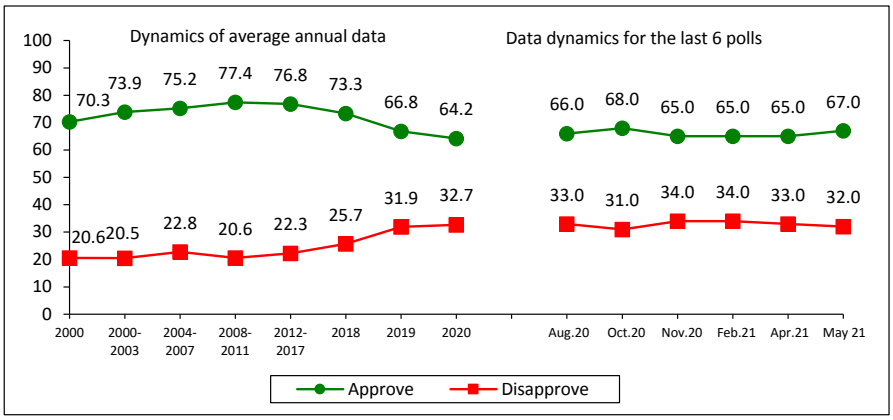
Annual dynamics (June 2021 to August 2020)	
Respond option	Dynamics (+ / –)
I approve	+1
I disapprove	-2

* Question: "In general, do You approve or disapprove of the work of the President of the Russian Federation?"

Data for June 2021 – average value for two polls: conducted on June 6, 2021 and June 13, 2021

Source: VCIOM data. Available at: https://wciom.ru/

In general, do you approve or disapprove of the work of V. Putin at the position of the President of Russia? (% of respondents; Levada-Center data)*



Annual dynamics (May 2021 to August 2020)	
Respond option	Dynamics (+ / –)
I approve	+1
I disapprove	-1

* Question: "In general, do you approve or disapprove of the work of V. Putin at the position of the President of Russia?"

Source: Levada-Center data. Available at: https://www.levada.ru/ (no data for December 2020).

[4] At the moment of writing this article, VCIOM latest data were dated June 13, 2021. Source: *VCIOM. Ratings*. Available at: https://wciom.ru/ratings/dejatelnost-gosudarstvennykh-institutov

[5] Latest data – May 2021. Source: Levada-Center. Indicators. Available at: https://www.levada.ru/indikatory

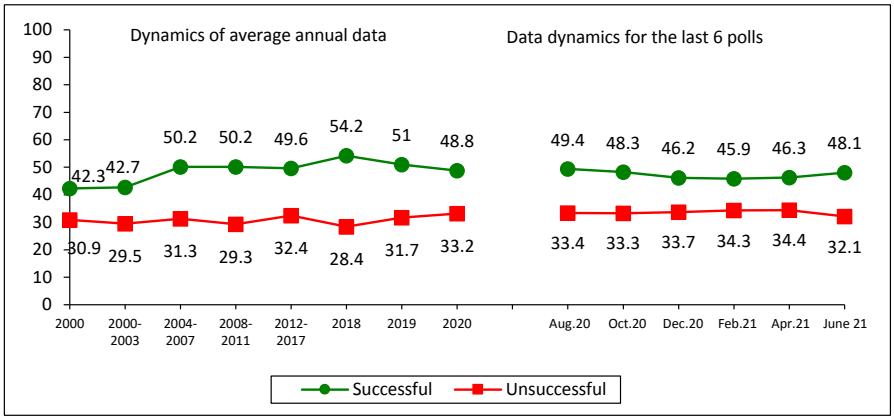
From April to June 2021, the share of the Oblast residents, who consider the President's work to solve the key problems of the country, has increased by 2–4 p.p.:

- ✓ strengthening Russia' international positions (from 46 to 48%);
- ✓ restoring order in the country (from 37 to 41%);
- ✓ protecting democracy and strengthening the freedoms of citizens (from 31 to 35%);
- ✓ boosting the economy and increasing the welfare of the population (from 23 to 27%).

As of June 2021, the share of positive assessments reflecting the success of the President's solution of the country's key problems corresponds to the indicators of August 2020.

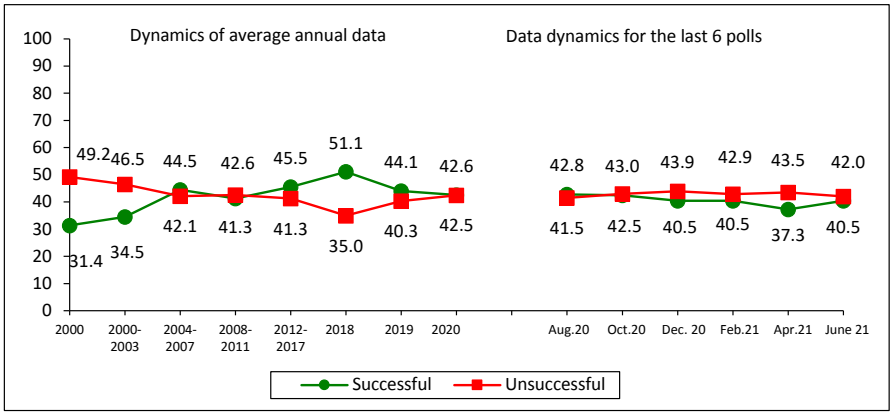
In your opinion, how successful is the RF President in coping with challenging issues..?
(% of respondents; VolRC RAS data)

Strengthening Russia's international positions



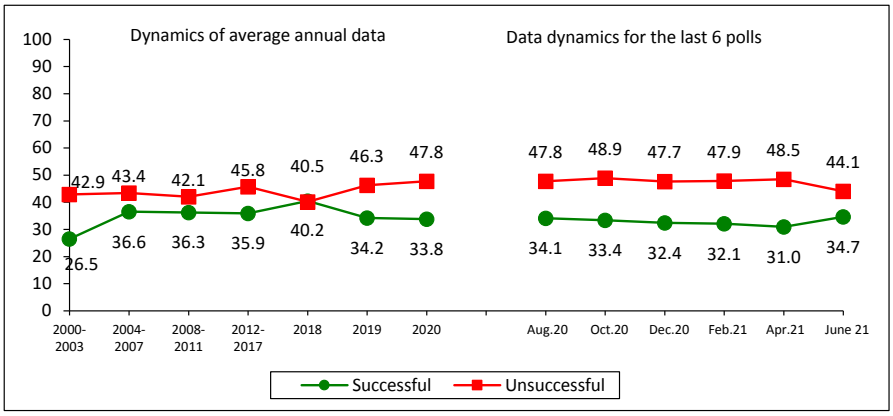
Annual dynamics (June 2021 to August 2020)	
Respond option	Dynamics (+ / –)
Successful	-1
Unsuccessful	-1

Imposing order in the country



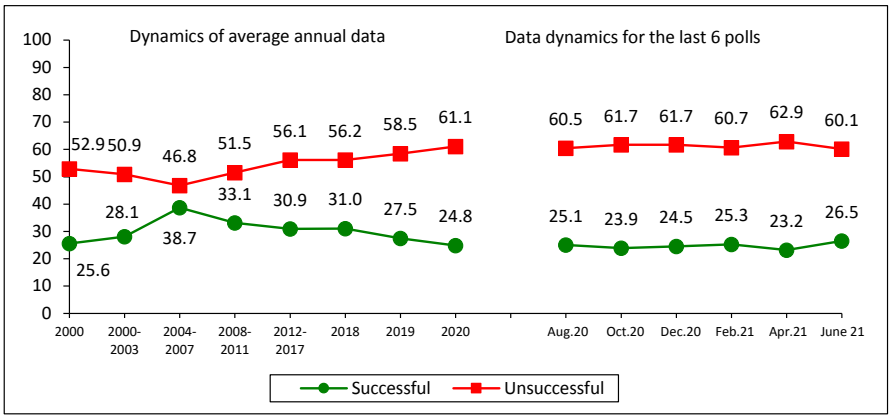
Annual dynamics (June 2021 to August 2020)	
Respond option	Dynamics (+ / –)
Successful	-2
Unsuccessful	+1

Protecting democracy and strengthening citizens' freedoms



Annual dynamics (June 2021 to August 2020)	
Respond option	Dynamics (+ / –)
Successful	-4
Unsuccessful	-2

Economic recovery and increase in citizens' welfare



Annual dynamics (June 2021 to August 2020)	
Respond option	Dynamics (+ / –)
Successful	0
Unsuccessful	+1

The structure of political preferences of the region's residents remains stable. It is still dominated by United Russia (the share of its supporters is 32%), the support of the other parties is much less: 9–10% – LDPR, 8–9% – KPRF, 3–4% – the Just Russia party.

More than the third of the region's population (35–36%) thinks that none of the political forces represented in the State Duma do not express their interests.

In general, a similar structure of political preferences was in August 2020.

Which party expresses your interests? (% of respondents; VolRC RAS data)

Party	Dynamics of average annual data										Data dynamics for the last 6 polls						Dynamics (+/-), June 2021 to Aug. 2020
	2000	2007	2011	Election to the RF State Duma 2011, fact	2012	2016	Election to the RF State Duma 2016, fact	2018	2019	2020	Aug. 2020	Oct. 2020	Dec. 2020	Feb. 2021	Apr. 2021	June 2021	
United Russia	18.5	30.2	31.1	33.4	29.1	35.4	38.0	37.9	33.8	31.5	30.9	31.1	30.9	30.5	31.5	32.1	+1
KPRF	11.5	7.0	10.3	16.8	10.6	8.3	14.2	9.2	8.8	8.4	8.6	8.8	7.3	8.3	8.7	8.1	-1
LDPR	4.8	7.5	7.8	15.4	7.8	10.4	21.9	9.6	9.1	9.5	9.3	9.4	9.5	10.1	9.9	8.5	-1
Just Russia	-	7.8	5.6	27.2	6.6	4.2	10.8	2.9	3.4	4.7	4.8	4.3	5.0	3.6	2.6	4.1	-1
Other	0.9	1.8	1.9	–	2.1	0.3	–	0.7	0.3	0.5	0.4	0.3	0.7	0.2	0.1	0.1	0
None	29.6	17.8	29.4	–	31.3	29.4	–	28.5	33.7	34.2	33.6	33.8	35.3	35.9	36.4	35.4	+2
Hesitate to respond	20.3	21.2	13.2	–	11.7	12.0	–	11.2	11.0	11.1	12.4	12.2	11.2	11.3	10.9	11.8	-1

In June 2021, the trend of improving assessments of public sentiment continued. Over the past two months, the indicators of the population's social well-being have improved (by 3 p.p.) (from 63 to 66%); the share of those who think that "everything is not so bad, and it is possible to live; it is difficult to live, but it is possible to stand it" – by 3 p. p. (from 74 to 77%).

The share of people who positively characterize their mood and have a high potential for patience is higher than in August 2020. (by 9 and 4 p. p., respectively).

The share of the Oblast residents who subjectively classify themselves as "poor and extremely poor" did not change significantly from April to June 2021 (47–48%).

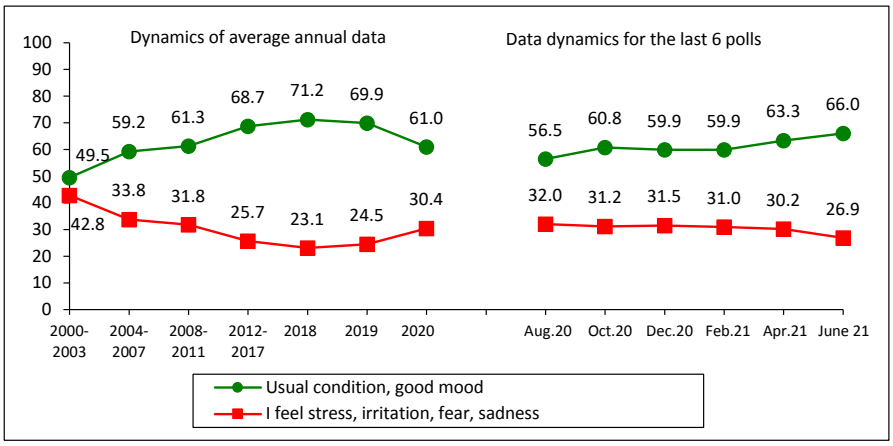
It is worth noting that in August 2020, the share of "poor and extremely poor" people was higher by 3 p.p. (50%).

Consumer sentiment Index (CSI) reflecting people's forecasts regarding the prospects for economic development and their personal financial situation, as in April 2021, amounted to 83 points.

CSI is significantly lower than in August 2020 (86 p.), while in fact, since the global financial crisis, CSI has not exceeded the mark of 100 points which means that pessimistic forecasts prevail in population estimates.

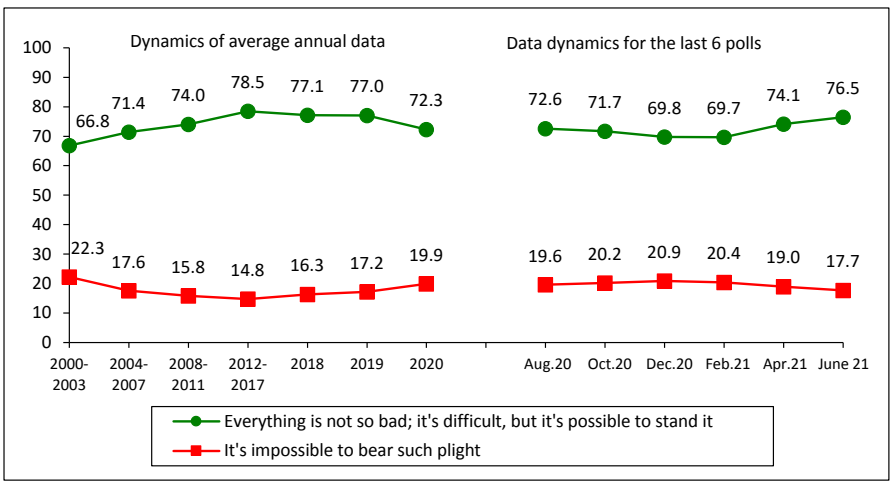
Estimation of social condition (% of respondents; VolRC RAS data)

Social mood



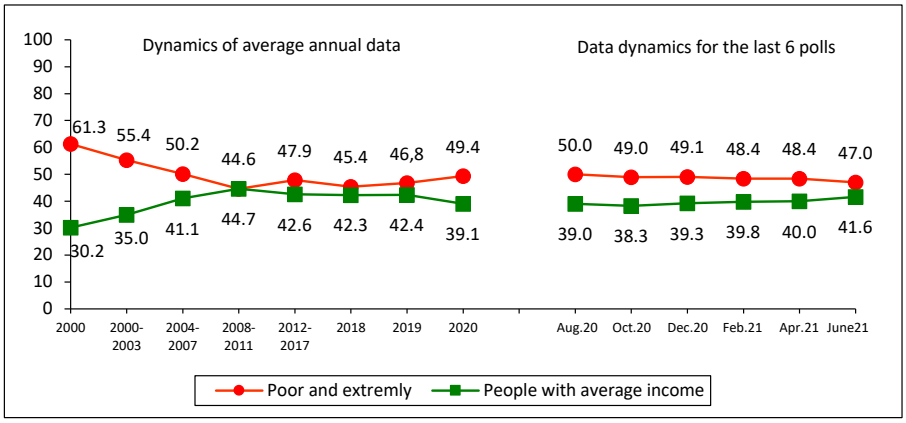
Annual dynamics (June 2021 to August 2020	
Respond option	Dynamics (+ / –)
Usual condition, good mood	+10
I feel stress, irritation, fear, sadness	-5

Stock of patience



Annual dynamics (June 2021 to August 2020	
Respond option	Dynamics (+ / –)
Everything is not so bad; it's difficult to live, but it's possible to stand it	+4
It's impossible to bear such plight	-2

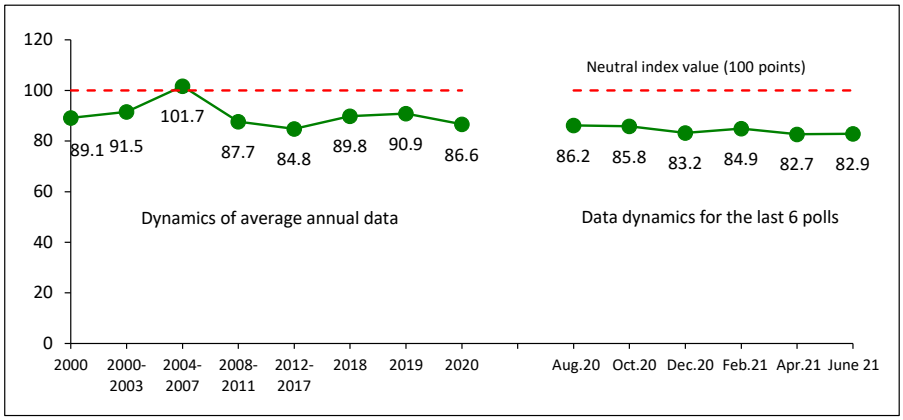
Social self-identification*



Annual dynamics (June 2021 to August 2020	
Respond option	Dynamics (+ / –)
People with average income	+3
Poor and extremely poor	-3

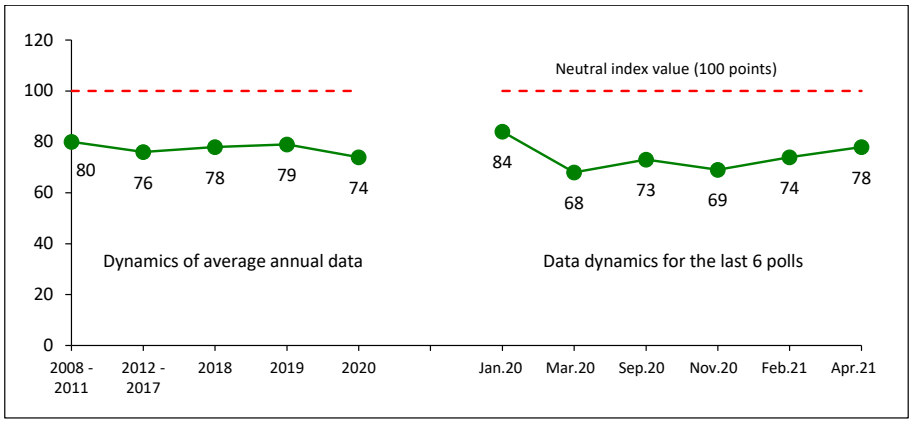
* Question: “Which category do you belong to, in your opinion?”

Consumer Sentiment Index
(CSI, points; data of VolRC RAS for the Vologda Oblast)



Annual dynamics (June 2021 to August 2020	
CSI	Dynamics (+ / –)
Index value, points	-3

Consumer Sentiment Index (CSI; Levada-Center data* for Russia)



Annual dynamics (June 2021 to August 2020	
CSI	Dynamics (+ / –)
Index value, points	-6

* Index is calculated since 2008

Source: Levada-Center data. Available at: https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/

Latest data is for April 2021. There are no data for the period from April to August 2020.

Over the past two months, in most socio-demographic groups (in 8 out of 14), the share of people who positively characterize their daily mood has increased slightly, especially among people under the age of 30 (by 6 p.p., from 67 to 73%), people with secondary and incomplete secondary education (by 6 p.p., from 57 to 63%), as well as those who, according to self-estimates of their own income, belong to the category of 20% of the most wealthy residents of the Oblast (by 6 p.p., from 71 to 77%).

Positive changes are noted in the dynamics for the period from August 2020 to June 2021: the share of people experiencing mainly positive emotions is higher in all socio-demographic groups (except for the 20% of the most wealthy), especially among residents of Cherepovets (by 16 p.p., from 54 to 70%), people aged 30–55 years (by 14 p.p., from 56 to 70%), in the category of the 20% least wealthy (by 14 p.p., from 40 to 54%).

Social mood in different social groups (respond option "Wonderful mood, normal, stable condition", % of respondents; VolRC RAS data)

Population group	Dynamics of average annual data							Data dynamics for the last 6 polls						Dynamics (+/–), June 2021 to Aug. 2020
	2000	2007	2011	2012	2018	2019	2020	Aug. 2020	Oct. 2020	Dec. 2020	Feb. 2021	Apr. 2021	June 2021	
Gender														
Male	50.1	65.9	64.5	69.1	72.8	70.1	60.8	55.6	60.7	60.0	60.8	61.3	65.1	+10
Female	43.3	61.7	62.0	65.8	69.8	69.6	61.2	57.3	60.8	59.8	59.2	64.9	66.7	+9
Age														
Under 30	59.1	71.3	70.0	72.3	80.0	81.1	67.6	69.0	64.6	65.2	60.9	67.4	73.0	+4
30–55	44.2	64.8	62.5	67.9	72.6	71.2	61.8	56.2	62.5	60.9	64.4	65.5	70.0	+14
Over 55	37.4	54.8	58.3	62.1	65.2	63.3	57.4	51.9	56.9	56.5	54.1	59.1	58.3	+6
Education														
Secondary and incomplete secondary	41.7	58.4	57.4	57.2	64.8	63.2	56.1	51.7	56.9	52.6	56.2	56.9	62.5	+11
Secondary vocational	46.4	64.6	63.6	66.7	72.2	72.7	63.5	59.1	63.5	62.5	60.9	64.3	66.1	+7
Higher and incomplete higher	53.3	68.6	68.3	77.0	76.8	73.4	63.3	58.6	61.4	64.6	62.7	68.7	69.7	+11
Income groups														
Bottom 20%	28.4	51.6	45.3	51.5	57.3	53.2	43.4	40.4	46.0	38.9	44.3	49.8	54.2	+14
Middle 60%	45.5	62.9	65.3	68.7	71.9	71.4	62.6	56.6	61.9	63.3	60.1	65.8	67.0	+10
Top 20%	64.6	74.9	75.3	81.1	82.9	81.8	75.6	76.4	70.6	76.3	76.0	70.8	76.5	0
Territories														
Vologda	49.2	63.1	67.1	73.6	71.0	68.6	60.9	57.0	61.0	58.7	55.8	57.0	59.4	+2
Cherepovets	50.8	68.1	71.2	76.2	75.8	71.2	60.4	54.4	59.3	60.7	64.4	68.1	70.8	+16
Districts	42.2	61.6	57.1	59.8	68.7	69.8	61.4	57.5	61.4	60.0	59.7	64.0	67.1	+10
Oblast	46.2	63.6	63.1	67.3	71.2	69.9	61.0	56.5	60.7	59.9	59.9	63.3	66.0	+10

Conclusions

The results of the next stage of monitoring show mainly positive changes in the dynamics of public mood for the period from April to June 2021.

First of all, it concerns the characteristics of people's psychological well-being, as well as assessments of the President's solution success of the country's key problems.

A number of factors could have influenced the improvement of population emotional state: new measures to support certain categories of citizens which were announced by the President during another Address to the Federal Assembly of the Russian Federation held in April 2021; the positive attitude of people to the ongoing vaccination against coronavirus; the celebration of the Victory Day and the non-working week announced during this period; the onset of the summer "holiday vacation" season...

There are many reasons for improving social mood assessments, but, apparently, they are not related to a tangible improvement in the financial situation of population. For instance, over the past two months, the share of the Oblast residents who consider themselves to be "poor and extremely poor" has not changed and amounted to 46–48% (which is higher than the share of people of "average income"). Consumer sentiment index remains consistently low (83 p.).

Vladimir Putin's personal meeting with J. Biden should be attributed to the unambiguously important and positive events of recent days after which a relative "warming" began to be seen in relations between Russia and the United States; it was extremely expected in the conditions of high tension that characterized the international political situation in the first months of 2021. According to experts, "the first step toward what can be called peaceful coexistence was taken in Geneva... The short era of perception of Russia by American Democrats, thanks to the President Barack Obama's ability, as a regional power has ended" [6].

It is quite possible that this event will become, if not an impulse, then at least a unique period for Russia, when the implementation of the President's public promises (including implementation of national projects) will no longer be hindered by the tense foreign policy situation.

For the present, we can make positive, but very cautious forecasts on this issue the realism of which will be confirmed (or refuted) by the following measurements of public opinion monitoring.

Materials were prepared by M.V. Morev, I.M. Bakhvalova

[6] Remchukov K. Biden and Putin have started the game. Quite possible, it is a great game. *Nezavisimaya Gazeta*, June 17, 2021. Available at: https://www.ng.ru/editorial/2021-06-17/2_8176_editorial.html

In Memory of M.F. Sychev

On June 22, 2021, Mikhail Fedorovich Sychev, a Substantial Man, a scientist and practitioner with a huge life and professional experience, who worked for the Vologda Oblast for many years, passed away at the age of 85.

Mikhail Fedorovich Sychev was a Candidate of Sciences (Economics), at one time a prominent Party Figure, Head of Agricultural Department of the Vologda Oblast Committee of the CPSU, second secretary of the Oblast Committee of the CPSU, Delegate of the 27th and 28th Party Congresses, Deputy of the Supreme Soviet of the RSFSR. In the 90s, he was one of the leaders of the process of restoring and reviving the activities of the Vologda Oblast Organization of the CPSU.

Before retiring for a well-deserved rest, he was working for 25 years at the Vologda Research Center of the Russian Academy of Sciences.

Mikhail Fedorovich was born on October 23, 1935 in the village of Turmasovo near Michurinsk.

After graduating from the Michurin Fruit-and-Vegetable Growing Institute in 1959, M.F. Sychev was sent to the Vologda Oblast, where he began working as an agriculturist of the collective farm "Druzhba". In the autumn of 1959, he was elected as the first secretary of the Cherepovets District Committee of the All-Union Leninist Young Communist League, and a year

later he was a secretary of the Vologda Oblast Committee of Komsomol. He studied at the Higher Party School. At the Institute of Economics of the Academy of Sciences of the Soviet Union, he completed his dissertation prepared on the case study of the analysis of collective farms' activities in the Vologda Oblast, and received the degree of Candidate of Sciences (Economics).

Until 1967, Mikhail Fedorovich worked as an assistant to the first secretary of the Oblast Committee A.S. Drygin; in 1968 he was appointed as the Head of Agricultural Department of the Vologda Oblast Committee of the CPSU. In 1984, he was approved as the secretary of the Oblast Party Committee, and subsequently became the second secretary of the Oblast Committee of the CPSU.

For almost a quarter of a century, Mikhail Fedorovich was a part of a team of managers who brought the Vologda Oblast to the level of economically and socially developed regions. After the "perestroika" and the destruction of the existing management system in the country, he did not change his life and human principles and ideals, directed his knowledge, experience and energy to the reconstruction of the communist organization in the Vologda Oblast, development of academic science and scientific and methodological basis for the regional functioning in market conditions.

Mikhail Fedorovich made a great contribution to the formation and development of the Vologda Research Center of the Russian Academy of Sciences. For a long time, he worked as a Deputy Director of the organization, Head of Department, supervised the conduct of research works, development of scientific journals. M.F. Sychev sought to ensure that research was in demand in the practice of public administration, was actively engaged in organizing interaction with authorities. Under his scientific supervision, a number of PhD theses were defended, with a deep personal interest, he provided consulting and methodological assistance to young scientists.

During the years of his work, significant changes took place at the Vologda Research Center of RAS with his direct participation which contributed to the institution's reaching a new level.

For his success in the work, Mikhail Fedorovich was awarded medals and orders: in 1971 and 1973 it was the Order of "Honor Badge", in 1981 – the Order of Peoples' Friendship, honorary certificates of RAS and the Workers' Union of RAS. In 2013, as a member of the research team, M.F. Sychev was awarded the State Prize of the Vologda Oblast for Science and Technology for his research work "Trends and problems of the regional development" (in 4 volumes), and in 2015 he was awarded the badge "For Valorous Labor to the Vologda benefit".

The whole life of Mikhail Fedorovich was endless dedication to his chosen cause and service to people. He was a sensitive and sympathetic person, not indifferent to other people's problems, always extended a helping hand to those in need of him, supported not only with words, but also with deeds. Communication with M.F. Sychev helped everyone to enrich themselves with valuable experience which Mikhail Fedorovich generously shared with everyone. Thanks to his knowledge, creative thinking, ability to see the opportunities, high moral and ethical principles, he enjoyed well-deserved authority and respect among colleagues.

Mikhail Fedorovich concluded one of his last interviews with the words "Everything remains for people!" He did leave a significant mark in the Vologda Oblast history, made a great contribution to creation of modern agricultural production and development of academic science in the region. The bright memory of this talented scientist, wise and sympathetic person will forever remain in our hearts.

Staff of the Vologda Research Center of RAS,
Members of Editorial Board and Editorial Staff of the Journal

AUTHOR GUIDELINES
for Submission of Manuscripts to the Editor of the Scientific Journal
Economic and Social Changes: Facts, Trends, Forecast

The Journal publishes original theoretical and experimental articles that fall within the scope of the journal. The manuscript should be of no less than 16 pages (30,000 characters with spaces). The maximum length of the paper submitted to publication is 25 pages (approximately 50,000 characters with spaces). Book reviews, information on scientific conferences, scientific chronicles are also submitted to publication. The papers should contain research findings of completed and methodologically proper works.

The decision for publication is made by the Journal's Editorial Staff on the basis of the reviewer's report. The novelty, scientific importance and relevance of submitted material are also taken into consideration. Articles rejected by the Editorial Staff will not be re-considered.

Requirements to the package of materials submitted

The following materials are submitted to the editorial office in electronic form:

1. A file containing the article in a Microsoft Word document, format .docx. The name of the file is typed in the Roman characters and reflects the author's last name (e.g.: Ivanova.docx).
2. Full information about the author on a separate page: full name, academic degree and title, place of work and position, contact information (postal address, telephone, e-mail – if available), ORCID, Researcher ID. The information should be arranged in a table.
3. Scanned copy of the commitment of the author not to publish the article in other publications.
4. A color photo of the author in the .jpeg / .jpg format of no less than 1 MB.

The package of materials is to be sent to the editor's email address: esc@volnc.ru.

Text design requirements

1. Margins

Right – 1 cm, others – 2 cm.

2. Font

Font size of the article's text – 14, type – Times New Roman (in case a special type font is needed, when typing Greek, Arab, etc. words, Windows default fonts are to be used). In case the paper contains seldom used fonts, they (font family) are to be submitted along with the file. Line interval – 1,5.

3. Indent – 1.25. Made automatically in MS Word.

4. Numbering

Page numbers are placed in the lower right corner of the page automatically with the use of MS Word tools.

5. First page of the article

In the upper right corner, the UDC is placed, under it, after the 1.5 spacing – the LBC, then – the symbol ©, indent (spacing), and the name and initials of the author in semi-bold. After the 2-spacing indent, the title of the article is given. Central alignment is used for the title of the article given in semi-bold. The abstract and key words are given below, after the 2-spacing indent, without a paragraph indent, in italics and aligned by width. Then, after the 2-spacing indent, the text of the article is placed.

6. Abstract

The abstract contains from 200 to 250 words. The abstract states the purpose of the research, points out its undoubted scientific novelty and its differences from similar works of other scientists; contains the methods used by the author and the main results of the work performed; identifies areas of application of the results of the study; briefly formulates the prospects for further research in this area.

Examples of good abstracts for different types of articles (reviews, scientific articles, conceptual articles, application articles) are available at: http://www.emeraldinsight.com/authors/guides/write/abstracts.htm?part=2&PHPSESSID=hdac5rtkb73ae013ofk4g8nrv1.

7. Key words

There should be not more than eight words or word combinations. Key words should reflect the content of the manuscript to the fullest extent. The number of words within a phrase should not exceed three.

8. Tables

The caption of the table and its number (if present) are given in normal font, without highlighting. The caption runs in bold and is center aligned.

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[1] Information about the modified Harvard standard is given in the book: Kirillova O.V. *Redaktsionnaya podgotovka nauchnykh zhurnalov po mezhdunarodnym standartam: rekomendatsii eksperta BD Scopus* [Editorial Preparation of Scientific Journals according to International Standards: Recommendations of a Scopus Expert]. Moscow, 2013. Part 1. 90 p.

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