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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.

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In 2017 the socio-economic research was supplemented by agricultural issues. ISED T 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 VoIRC 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.

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VoIRC 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 ISED T 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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EDITORIAL

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Voters Supported the President: On the Results of the Election to the State Duma of the Eighth Convocation



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Abstract. On September 17–19, 2021, the election to the State Duma of the Russian Federation of the eighth convocation took place in Russia. The article analyzes the outcome of the vote according to official data of the Central Election Commission of the Russian Federation. The results of the past elections are considered broken down by federal district, constituent entity, and municipality of the Russian Federation. We analyze the dynamics of the outcome of the parliamentary elections for the period from 2007 to 2021. The results of the latest election are compared with the results of the RF presidential election (2018) and the all-Russian referendum on amendments to the Constitution (2020). We consider the latest parliamentary election in a broad context – as part of the internal Russian political process. In this regard, a significant part of the article is devoted to the analysis of specific managerial decisions made by the Russian President and aimed at addressing the issue of forming a new, post-Soviet statehood, the key

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elements of which were revealed in the President's article "Russia at the turn of the Millennium" (1999). Official statistics, independent experts' assessments and sociological research findings allow us to say that the head of state has adopted comprehensive and consistent decisions to achieve the tasks he formulated in 1999 (the Russian idea, a strong state, an efficient economy); but so far, not all the goals stated in these tasks have been achieved. At a meeting with deputies of the State Duma of the eighth convocation the President noted that the low level of Russians' income was the main obstacle to stable development and demographic future. And it is the most objective self-assessment of the effectiveness of the entire system of public administration.

Key words: President, State Duma election, public administration efficiency, nationalization of the elites, socio-political agenda.

September 17–19, 2021, the election to the State Duma of the 8th convocation was held in Russia. In our opinion, this event should be analyzed "in the context of large and small life cycles of the country's political system"¹, that is, as part of the internal Russian political process which took place in a certain context of global trends in world politics on the one hand, and in domestic political life on the other hand, along with presidential elections (in which voters have already supported Vladimir Putin four times) and the all-Russian referendum on amendments to the Constitution.

Each of these political events and forms of expressing the will of the people is a kind of large-scale cross-section of public opinion, allowing us to see trends in the key changes in the socio-political agenda at the federal level, as well as expectations of society from the government.

In other words, we, as the authors of the article, are interested in the results of the latest vote not only from the point of view of the balance of political forces in parliament; we consider the results **as markers of the changes taking place in society and as markers of the RF President's consistent efforts aimed at the formation of a new, post-Soviet statehood, as well as the framework of**

"Never in recent decades has U.S. policy been so contradictory, inconsistent and openly disastrous. This is the most important thing. Today America is weaker than ever... Biden **is just rapidly destroying America**, and the more globalism agonizes, the more clearly humanity sees the weakness of the one who recently claimed to be the undisputed leader...

Russia has a historic chance not only to make multipolarity irreversible, but also to dramatically expand the area of its influence on an almost global scale... It requires strategy, determination, will, concentration of forces. And the key point is that it requires ideology. Big geopolitics requires big ideas"².

the public administration system, which he will hand over to his successor in the future.

Speaking about the foreign policy situation, we should note that the State Duma election that took place on September 17–19, 2021 was held under relatively calm conditions. The term "relatively" in this context is most appropriate. Granted, there have been no concrete and drastic steps aimed at weakening Russia; nevertheless, the anti-Russian

¹ Skorobogatyi P. Fears and prospects of the eighth convocation. *Ekspert*. September 27, 2021. Available at: <https://expert.ru/expert/2021/40/strakhi-i-perspektivy-vosmogo-sozyva/>

² Dugin. America is retreating. It's time to advance. *Zavtra*. September 27, 2021. Available at: https://zavtra.ru/blogs/amerika_otstupaet_vremya_nastupat_

sanctions still remain, as well as regular references to the “Russian threat” in public speeches by international politicians, attempts by the Ukrainian authorities to consolidate the Western political establishment based on opposition to the Kremlin’s geopolitical influence, the ongoing tension due to occasional large-scale military exercises and attempts to make Russia the main culprit of the energy crisis in Europe.

Nevertheless, if we assess the international political situation around Russia during the parliamentary election and (for example) at the beginning of 2021, we can state with a certain degree of confidence that it has not experienced a dramatic deterioration. This is partly due to an objective combination of circumstances that does not depend on the actions of the Russian authorities (such circumstances include a continuing decline in the geopolitical status of the United States after the withdrawal of NATO troops from Afghanistan, the instability of political relations between some foreign countries³, the “gas crisis” in Europe).

However, in many ways, the fact that the State Duma election campaign was as peaceful as possible and was not accompanied by any signs of a sharp deterioration, is the result of the following **purposeful and strategically verified actions of the President himself and his team:**

✓ some tension in relations with the United States (which is especially evident in comparison to the beginning of 2021) was eased after a personal meeting between Vladimir Putin and Joe Biden in June 2021;

✓ a law prohibiting persons involved in the activities of extremist organizations from being elected to any positions in power⁴ was adopted in time (or maybe it was a bit overdue); this, in fact, leveled the possibilities of the non-systemic opposition to create a situation of mass protests around the parliamentary elections, similar to the one that took place in 2011⁵;

✓ the construction of the Nord Stream 2 gas pipeline was completed; today the pipeline is becoming an important tool in ensuring the economic, energy and political security of the country;

✓ the Russian economy has been gradually recovering after a crisis caused by the COVID-19 pandemic (as announced by the President on September 21, 2021).

“Despite the general unstable situation in the global economy and the complex processes going on in world markets, the Russian economy has recovered. Just a little while ago, we said it “has recovered in general”; today we can already say that it has recovered”⁶.

³ Recall the episode when on September 16, 2021, a trilateral agreement was officially announced between the United States, the UK and Australia on the procurement of weapons and the creation of own defense alliance, which dealt a serious economic blow to France and a political blow to its president E. Macron.

⁴ Federal Law 157-FZ dated June 4, 2021 “On amendments to Article 4 of the Federal Law “On basic guarantees of electoral rights and the right to participate in a referendum of citizens of the Russian Federation”. After its adoption on June 4, 2021, the activities of all headquarters of Alexei Navalny* were suspended; since April 30, 2021 his headquarters are on the “List of organizations with respect to which there is information about their involvement in extremist activities or terrorism”.

* The activities of A. Navalny’s headquarters are recognized as extremist and banned in the territory of the Russian Federation.

⁵ The protest campaign under the slogan “We support a just election” began in December 2011 after the election to the State Duma, when observers at polling stations reported numerous violations during the voting. The first rally took place in Moscow in Chistye Prudy area on December 5, 2011; the mass rally on December 10 on Bolotnaya Square (which gave an informal name to the entire protest movement) unexpectedly became the turning point; the most numerous was the rally on Academician Sakharov Avenue on December 24: according to organizers, up to 120 thousand people took part in it. In addition to Moscow, protest actions in December 2011 were held in 99 cities of Russia. The march on May 6, 2012 ended with a clash with the police; following the results of the march, more than 30 criminal cases were initiated, many defendants were sentenced to imprisonment for a term of 2.5 to 4.5 years. “Bolotnaya protests” have become the most massive in Russia in the 21st century” (Source: Saprykin Yu.B. Bolotnaya: Yuri Saprykin about how we left our mark in a Big History and got away with it. *Kommersant*. July 30, 2021. Available at: <https://www.kommersant.ru/doc/4910676>).

⁶ Vladimir Putin’s speech at a meeting on economic issues on September 21, 2021. *Official Website of the RF President*. Available at: <http://www.kremlin.ru/events/president/news/66738>

The head of state made sure that foreign policy conditions did not become a force majeure circumstance that prevails on the Russians' choice of the new parliament composition. Or, in other words, the voting results reflect the internal socio-political agenda and the internal state of Russian society quite clearly.

For example, we would like to focus on some of the most significant trends according to the results of the analysis of the database of the Central Election Commission of the Russian Federation⁷.

First, the increase in voter turnout in 2021 in comparison with the 2016 State Duma election (Insert 1).

If we compare the results of parliamentary elections from 2007⁸ to 2021, it should be noted that over the past 13 years, the number of Russians taking part in the voting has decreased by 13 million

people (the turnout has decreased from 64 to 52%; see Insert 1).

However, in 2021, compared with 2016, nationwide turnout increased by 4 p.p. (from 48 to 52%), that is, by almost 3.8 million people. At the same time, in the 2016 election the turnout growth was noted only in four regions of the Russian Federation, while in 2021 it was noted in 60 regions (*Tab. 1*).

The increase in the voting period from one to three days, as well as the introduction of an online voting form, could hardly have produced such a significant impact. For example, the increase in the voting period up to three days at the referendum on the adoption of amendments to the Constitution did not lead to the fact that the turnout at the polling stations was greater than at the presidential election in 2018 (in both cases it was 68%).

Table 1. The number of RF constituent entities in which the turnout at the State Duma elections has increased

Turnout, % of the number of voters	2016 compared to 2011 (results of the election to the State Duma of the 7th convocation)	2021 compared to 2016 (results of the election to the State Duma of the 8th convocation)	Dynamics (+ / -)
Amount of RF constituent entities in which the turnout increased	4	60	+54
Calculated according to: RF Central Election Commission database. Available at: http://www.vybory.izbirkom.ru/region/izbirkom			

⁷ The work with the database of the Central Election Commission was carried out in the period from September 25 to September 30, 2021. The CEC does not contain data on federal districts. Their relative values (%) were calculated as the average for the RF constituent entities included in this district; their absolute values (people) were calculated as the sum of the RF constituent entities included in this district.

Regarding the majority of territories (53 out of 85), the CEC database does not present data on average for an RF constituent entity; rather, it presents data broken down by several district commissions of a given constituent entity. In these cases, data were collected for each district commission. Further, relative data for the entire RF constituent entity (%) were calculated as the average for all district commissions; absolute data for the RF constituent entity (people) were calculated as the sum for all district commissions. A random check of the voting results officially announced by territorial divisions of the CEC has shown that after the calculations the turnout coincides to the nearest hundredth, the results of voting by party are slightly different (the difference is no more than 1%).

⁸ When we analyze the dynamics of the voting results, we take 2007 as the base year, when, according to many indicators (in particular, those reflecting people's attitude toward the work of the President, and the consumer sentiment index, reflecting people's perception of the future of the Russian economy and their personal financial situation) the most favorable situation has developed, as evidenced by the public opinion estimates.

This, in particular, is shown by the results of the public opinion monitoring, which has been conducted by VoIRC RAS since 1996 on the territory of the Vologda Oblast. During the entire period of the surveys, the highest level of support for the President's activities (75%), as well as the highest value of the consumer sentiment index (106 points), was observed in 2007–2008; this means that people's ideas about the future of their well-being and the country's economy as a whole were positive at that very time.

More detailed information is provided in Insert 2.

Insert 1

**DYNAMICS OF TURNOUT AT THE ELECTIONS TO THE STATE DUMA
OF THE 5TH–8TH CONVOCATIONS (2007–2021)**

Territory*	Turnout, %					Turnout, people						
	Year					Year						
	2007	2011	2016	2021	Dynamics, (+ / -)	2007	2011	2016	2021	Dynamics, (+ / -)		
Russia	63.78	60.21	47.88	51.72	+3.84	69609446	65766594	52700992	56484685	+3783693	-9281909	-13124761
North Caucasian Federal District	84.95	86.46	82.22	84.50	+2.28	4195352	4544971	4343313	4816364	+473051	+271393	+621012
Southern Federal District	63.22	61.51	48.27	55.00	+6.73	6621657	6510122	5896748	7219463	+1322715	+709341	+597806
Volga Federal District	69.13	64.30	54.44	53.69	-0.75	16043964	15100550	13083343	12614143	-469200	-2486407	-3429821
Ural Federal District	70.92	63.42	53.76	53.14	-0.62	6329229	5545692	4505820	4632619	+126799	-913073	-1696610
Central Federal District	60.98	58.78	45.29	48.62	+3.33	17546326	17049621	12270883	10326650	-1944233	-6722971	-7219676
Far Eastern Federal District	63.68	55.83	42.92	47.82	+4.90	2986327	2530907	1870528	2039513	+168985	-491394	-946814
Siberian Federal District	66.45	58.19	46.70	47.08	+0.38	9351476	8212790	6599218	6481100	-118118	-1731690	-2870376
Northwestern Federal District	58.28	55.29	40.49	42.43	+1.94	6230708	5961777	4131139	4449760	+318621	-1512017	-1780948

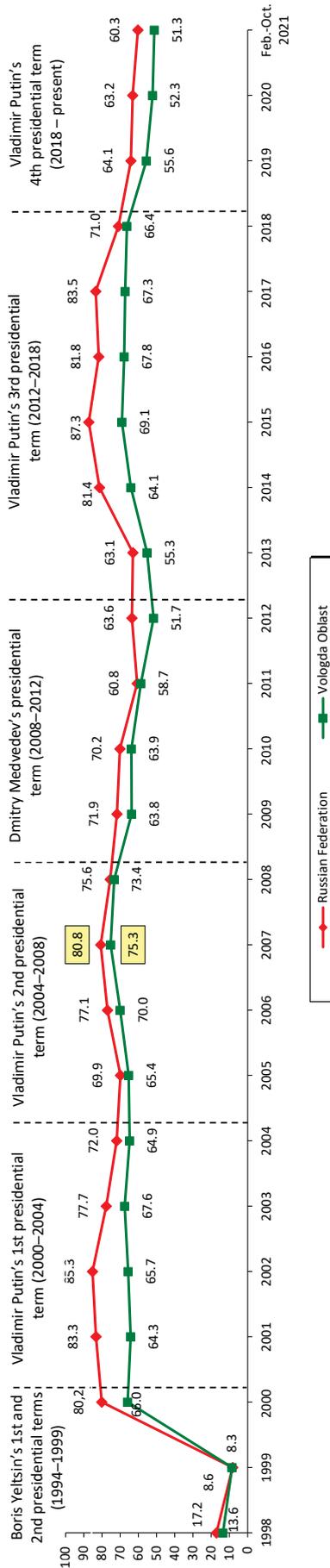
* Ranked in descending order of relative turnout (in %) for the year 2021.

At the election to the State Duma of the 8th convocation, the nationwide turnout increased for the first time in the period from 2007 to 2021 – from 48 to 52% (by 4 p.p., or 3.8 million people). The increase in the turnout is observed in almost all federal districts (except the Volga and Ural federal districts, where the share of people participating in parliamentary elections has been steadily decreasing since 2007).

At the same time, in general, over the period from 2007 to 2021, voter turnout at the elections to the State Duma decreased by 12 p.p. (from 64 to 52%); moreover, the decrease is noted in all federal districts. Thus, over the past 14 years, the number of people voting in parliamentary elections in the country as a whole has decreased by 13 million people.

Insert 2

Dynamics of the level of approval of the work of the President of the Russian Federation (proportion of positive assessments), % of respondents

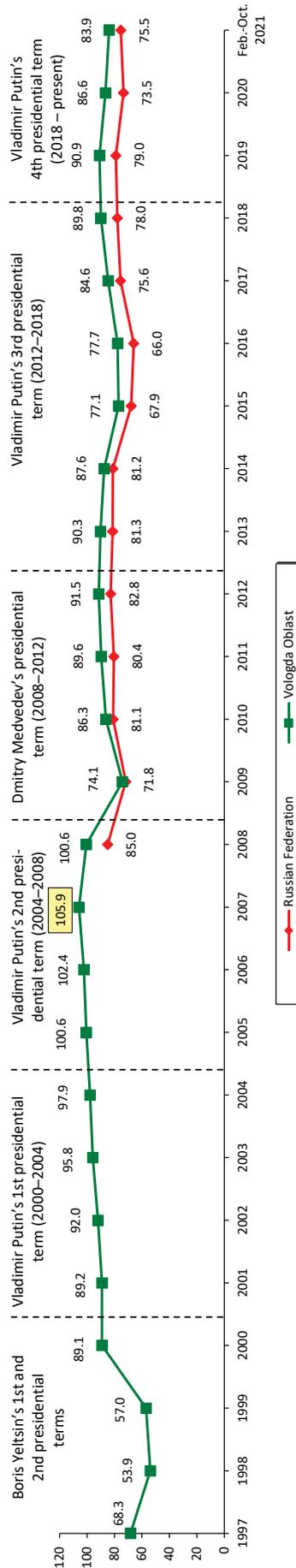


Vologda Oblast – VoIRC RAS data; Russian Federation – VTsIOM data (Source: <https://wciom.ru/>)

For the period from 1998 to 2021, the highest level of approval of the RF President’s work was noted in 2007 (in Russia – 81%; in the Vologda Oblast – 75%).

Nationwide, significant support for the work of the head of state was also registered in the periods from 2000 to 2002 and from 2014 to 2017, which was due to special circumstances for Russia – the country’s overcoming the crisis of the 1990s, and the Crimean spring of 2014.

Consumer Sentiment Index



Vologda Oblast – VoIRC RAS data; Russian Federation – Levada Center data*. Source: <https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikator/> (the dynamics of the data are presented since 2008; the latest data are for February – September 2021).

*Included in the register of foreign agents.

According to VoIRC RAS studies, the highest value of the consumer sentiment index (106 points) was registered in 2007, which indicates that people’s perceptions of the future of the Russian economy and their personal financial situation were mainly positive.

In addition, online voting in the 2021 election took place only in seven RF constituent entities⁹, and in all these territories, the turnout was less than the national average (43–50 vs. 52%; *Tab. 2*).

Second, the internal state of Russian society is reflected in the voting results for United Russia, the ruling party.

During the period from 2007 to 2021, the share of votes cast for the United Russia party decreased from 64 to 50%, or by almost 17 million voters (from 45 to 28 million; *Fig. 1; Insert 3*).

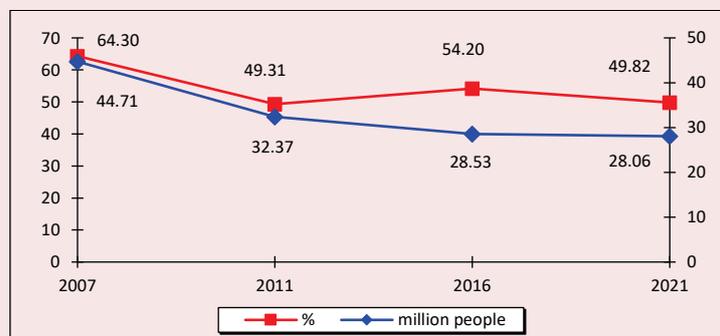
In 2021, the nationwide support for the party in power decreased from 54 to 50% (0.5 million people); deterioration of the position of United

Table 2. Dynamics of voter turnout at the election to the RF State Duma in the constituent entities in which online voting was tested in 2021

Территория*	Turnout						
	Year				Dynamics (+ / -), 2021 to...		
	2007	2011	2016	2021	2016	2011	2007
	%						
Russia	63.78	60.21	47.88	51.72	+3.84	-8.49	-12.06
Moscow	55.36	61.71	35.35	50.26	+14.91	-11.45	-5.10
Sevastopol	–	–	47.01	49.26	+2.25	–	–
Rostov Oblast	67.58	59.35	48.24	48.80	+0.56	-10.55	-18.78
Nizhny Novgorod Oblast	57.28	58.87	44.49	48.48	+3.99	-10.39	-8.80
Kursk Oblast	63.27	54.74	47.02	47.01	-0.01	-7.73	-16.26
Murmansk Oblast	58.14	51.87	39.73	43.84	+4.11	-8.03	-14.30
Yaroslavl Oblast	62.38	55.88	37.80	43.40	+5.60	-12.48	-18.98
	people.						
Russia	69609446	65766594	52700992	56484685	+3783693	-9281909	-13124761
Moscow	3970859	4433781	2634377	3905133	+1270756	-528648	-65726
Sevastopol	2233577	1964245	1573413	1659674	+86261	-304571	-573903
Rostov Oblast	1591380	1601889	1196988	1246468	+49480	-355421	-344912
Nizhny Novgorod Oblast	663813	590383	389313	436834	+47521	-153549	-226979
Kursk Oblast	618864	519503	443485	424788	-18697	-94715	-194076
Murmansk Oblast	411455	349647	248532	257491	+8959	-92156	-153964
Yaroslavl Oblast	–	–	147430	166555	+19125	–	–

* Ranked in descending order of the turnout in 2021.
 Calculated according to the RF Central Election Commission database. Available at: <http://www.vybory.izbirkom.ru/region/izbirkom>

Figure 1. Dynamics of support for the United Russia party in the State Duma elections for the period from 2007 to 2021



Source: RF Central Election Commission database. Available at: <http://www.vybory.izbirkom.ru/region/izbirkom>

⁹ Cities of Moscow and Sevastopol, the Nizhny Novgorod, Yaroslavl, Kursk, Murmansk and Rostov oblasts.

Russia compared to the previous elections to the State Duma was noted in 70 RF constituent entities (Tab. 3). At the same time, we cannot but agree with the estimates of experts who note that “if the ruling party gains 50% of the votes with a turnout of 50%, this means that only a quarter of citizens support the government”¹⁰. Nevertheless, United Russia managed to maintain a constitutional majority in parliament.

Such contradictory results for the support gained by the party in power objectively reflect the current public sentiment; **on the one hand, people are dissatisfied with the dynamics of the standard of living and quality of life, they do not approve of the stalling of national projects and promises voiced by the head of state in his Address to the Federal Assembly in 2018; on the other hand, society tries to address existing problems within the framework of the socio-political consensus that has developed today, supports the system of public administration created by V.V. Putin and supports the President of the Russian Federation himself.**

Third, it is worth noting that there is a growing support for the Communist Party of the Russian Federation (KPRF) and for the Just Russia party, while the position of the Liberal-Democratic Party of Russia (LDPR) has deteriorated; all this reflects the public’s demand for an agenda of a “leftist”

*nature (social justice, strong state power, priority of traditional spiritual and moral values)*¹¹.

Nationwide, the share of people who voted for the KPRF increased by 6 p.p. (from 13 to 19%; Insert 4). If in 2016, compared with 2011, the growth of support for the KPRF was noted only in 11 RF constituent entities, then in 2021, compared with 2016, it was noted in 79 regions (see Tab. 3).

The share of Russians who voted for Just Russia in 2021 increased by 2 p.p. compared to 2016 (from 6 to 8%; Insert 5). On the one hand, this is not much, but, on the other hand, the growth is noted in 63 RF constituent entities (while in the previous election, the increase in support for Just Russia was registered only in 11 regions). In part, the increase in support is due to the unification of the party with Z. Prilepin’s bloc; however, in our opinion, this is not the only explanation (as evidenced by the growth of support for the KPRF, and the deterioration of the position of the LDPR).

As for the LDPR, the nationwide share of those who support it has almost halved (from 12 to 7%; Insert 6). Moreover, we should pay attention to the fact that in the 2021 parliamentary election, the share of votes cast for the LDPR increased only in seven RF constituent entities, while in 2016 – in 68 (see Tab. 3).

Table 3. Number of RF constituent entities in which the support for parliamentary parties increased, % of voters

Political party	2016 to 2011 (results of the election to the State Duma of the 7th convocation)	2021 to 2016 (results of the election to the State Duma of the 8th convocation)	Dynamics (+ / –)
United Russia	52	15	–37
KPRF	11	79	+68
LDPR	68	7	–61
Just Russia	11	63	+52

Calculated according to the database of the RF Central Election Commission. Available at: <http://www.vybory.izbirkom.ru/region/izbirkom>

¹⁰ Glazyev S.Yu. The future lies with open voting. *Official Website of S. Yu. Glazyev*. September 29, 2021. Available at: <https://glazyev.ru/articles/136-chelovek-i-obshchestvo/95065-sergey-glaz-ev-budushhee-za-otkrytim-golosovaniem>

¹¹ The remaining parties (the ecological party “Zelenyye”, the Russian united democratic party “Yabloko”, the all-Russian political party “Partiya Rosta”, the Russian Party of Freedom and Justice, the Communists Party of Communist of Russia, the Civic Platform party, the Green Alternative party, the All-Russian political party “Motherland”, the Party of Pensioners) could not overcome the 5% barrier and gained 8.85% of the votes nationwide (in total, 4.98 million people voted for these parties).

Insert 3

DYNAMICS OF THE RESULTS OF VOTING FOR THE UNITED RUSSIA PARTY IN THE ELECTIONS TO THE STATE DUMA OF THE 5TH–8TH CONVOCATIONS (2007–2021)

Territory	United Russia, %				United Russia, people									
	Year		Dynamics (+ / -)		Year		Dynamics (+ / -)							
	2007	2011	2016	2021	2021 to 2016	2021 to 2011	2021 to 2007							
Russia	64.30	49.31	54.20	49.82	-4.38	+0.51	-14.48	44714241	32371737	28527828	28064200	-463628	-4307537	-16650041
North Caucasian Federal District	87.16	81.52	76.88	79.12	+2.24	-2.40	-8.04	3516990	3617187	3419444	3720876	+301432	+103689	+203886
Southern Federal District	65.45	54.81	58.27	55.48	-2.79	+0.67	-9.97	4290232	3363306	3472091	4171879	+699788	+808573	-118353
Volga Federal District	67.15	52.52	55.93	47.60	-8.33	-4.92	-19.55	11120950	8472634	7903534	6931079	-972455	-1541555	-4189871
Ural Federal District	67.75	50.37	48.80	44.39	-4.41	-5.98	-23.36	4094431	2548502	2057985	1849186	-208799	-699316	-2245245
Central Federal District	59.07	42.96	49.33	43.70	-5.63	+0.74	-15.37	10237771	7422895	5882747	6228124	+345377	-1194771	-4009647
Siberian Federal District	66.32	46.12	46.69	42.80	-3.89	-3.32	-23.52	5892147	3561156	3298976	2861971	-437005	-699185	-3030176
Far Eastern Federal District	63.96	45.61	44.58	39.57	-5.01	-6.04	-24.39	1830758	1020880	767917	701537	-66380	-319343	-1129221
Northwestern Federal District	57.02	36.47	41.67	34.94	-6.73	-1.53	-22.08	3493534	2168509	1725134	1599551	-125583	-568958	-1893983

* Ranked in descending order of the share of votes cast for the United Russia party in 2021.

In the 2021 parliamentary election, the share of people who voted for the United Russia party in Russia as a whole decreased by 4 p.p. (from 54 to 50%), or by 463 thousand people.

We should note that the decrease in support for the party in power in the 2021 election, compared with the 2016 election, is observed in all federal districts, except the North Caucasian Federal District. Moreover, in five of the eight districts (Volga, Ural, Siberian, Far Eastern, Northwestern), the share of votes cast for the United Russia party in 2021 was lower than in 2016 and 2007.

In general, over the period from 2007 to 2021, the share of Russians who voted for United Russia in the State Duma elections decreased by 14 p.p. (from 64 to 50%), that is, over the past 14 years, the party in power lost 16.7 million votes.

Insert 4

DYNAMICS OF THE RESULTS OF VOTING FOR THE COMMUNIST PARTY OF THE RUSSIAN FEDERATION (KPRF) IN THE ELECTIONS TO THE STATE DUMA OF THE 5TH–8TH CONVOCATIONS (2007–2021)

Territory*	KPRF, %					KPRF, people					Dynamics (+ / -)			
	Year					Year					2021 to 2016	2021 to 2011	2021 to 2007	
	2007	2011	2016	2021	2021 to 2016	2021 to 2011	2021 to 2007	2007	2011	2016	2021	2021 to 2016	2021 to 2011	2021 to 2007
Russia	11.57	19.19	13.34	18.93	+5.59	-0.26	+7.36	8046886	12599420	7019752	10660669	+3640917	-1938751	+2613783
Far Eastern Federal District	10.44	18.80	14.79	24.54	+9.75	+5.74	+14.10	329501	517324	302607	568862	+266255	+51538	+239361
Siberian Federal District	15.20	26.22	25.30	23.41	-1.89	-2.81	+8.21	149796	222525	151708	1441053	+1289345	+1218528	+1291257
Volga Federal District	10.88	19.34	14.30	21.68	+7.38	+2.34	+10.80	1670231	2805144	1701616	2352460	+650844	-452684	+682229
Central Federal District	14.46	22.78	15.15	21.34	+6.19	-1.44	+6.88	2500618	3732762	1804200	2969085	+1164885	-763677	+468467
Northwestern Federal District	11.49	19.93	13.69	21.14	+7.45	+1.21	+9.65	718204	1066272	515965	860606	+344641	-205666	+142402
Ural Federal District	8.00	14.25	11.23	17.21	+5.98	+2.96	+9.21	542558	833634	524938	863635	+338697	+30001	+321077
Southern Federal District	12.40	18.52	12.31	16.39	+4.08	-2.14	+3.99	852009	1244555	730153	1150462	+420309	-94093	+298453
North Caucasian Federal District	5.19	11.07	10.47	9.61	-0.86	-1.46	+4.42	284287	523513	411364	454506	+43142	-69007	+170219

* Ranked in descending order of the share of votes cast for the KPRF in 2021.

Nationwide support for the Communist Party in 2021 compared to 2016 increased by 6 p.p. (from 13 to 19%), or 3.6 million people. The share of people who voted for the KPRF increased in all federal districts, except for the Siberian and North Caucasian federal districts.

The share of Russians who voted for the KPRF in 2021 is slightly lower than in 2011. However, in general, over the period from 2007 to 2021, the indicator of support for the Communist Party increased by 7 p.p. (from 12 to 19%). The increase is noted in all federal districts; nationwide – by 2.6 million people.

Insert 5

DYNAMICS OF THE RESULTS OF VOTING FOR THE LIBERAL DEMOCRATIC PARTY (LDPR) IN THE ELECTIONS TO THE STATE DUMA OF THE 5TH – 8TH CONVOCATIONS (2007 – 2021)

Territory*	LDPR, %				LDPR, people						
	Год				Год						
	2007	2011	2016	2021	2007	2011	2016	2021	Dynamics (+ / -)		
Russia	8.14	11.68	13.14	7.55	5660823	7664516	6917063	4252252	-2664811	-3412264	-1408571
Ural Federal District	10.25	15.82	17.08	10.95	659564	837698	751832	452828	-299004	-384870	-206736
Far Eastern Federal District	10.68	16.32	20.46	10.69	339710	438334	388029	209198	-178831	-229136	-130512
Northwestern Federal District	10.40	14.90	17.70	10.12	590797	799481	650450	399259	-251191	-400222	-191538
Siberian Federal District	8.86	14.04	16.33	8.52	911472	1240810	1026458	570349	-456109	-670461	-341123
Central Federal District	9.10	12.50	14.85	8.48	1484559	1981760	1717350	1077023	-640327	-904737	-407536
Volga Federal District	7.56	11.25	12.78	7.89	1096845	1496636	1456245	898272	-557973	-598364	-198573
Southern Federal District	6.41	9.01	12.41	6.92	465735	679570	777886	511550	-266336	-168020	+45815
North Caucasian Federal District	1.86	2.62	2.90	1.85	98833	166800	148813	113773	-35040	-53027	+14940

* Ranked in descending order of the share of votes cast for the LDPR in 2021.

In the 2021 parliamentary election, the Liberal Democratic Party of Russia (LDPR) lost 5.6% of the vote compared to the 2016 election (2.7 million people). The share of people who voted for the LDPR, compared with the previous elections to the State Duma, decreased in all federal districts (especially in the Far Eastern, Ural and Central – by 6–10 p.p.).

At the same time, in the period from 2007 to 2021, the LDPR has not actually lost its positions: in all federal districts, changes are insignificant (no more than 1% of votes). Nationwide support for the LDPR decreased from 8.1% to 7.6%, or by 1.4 million people.

Insert 6

**DYNAMICS OF THE RESULTS OF VOTING FOR THE “JUST RUSSIA – PATRIOTS – FOR THE TRUTH” PARTY IN
THE ELECTIONS TO THE STATE DUMA OF THE 5TH–8TH CONVOCATIONS (2007–2021)**

Territory*	Just Russia, %					Just Russia, people							
	Year					Year							
	2007	2011	2016	2021	2021 to 2016	2021 to 2011	2021 to 2016	2021 to 2011	2021 to 2016	2021 to 2011			
Russia	7.74	13.25	6.22	7.46	+1.24	-5.79	-0.28	8695458	3275053	4201744	+926691	-4493714	-1181895
Ural Federal District	10.60	20.24	8.53	10.33	+1.80	-9.91	-0.27	1283110	346352	463240	+116888	-819870	-268910
Far Eastern Federal District	6.44	13.62	11.09	10.17	-0.92	-3.45	+3.73	932001	575271	561372	-13899	-370629	+95272
Northwestern Federal District	8.66	14.99	6.22	8.37	+2.15	-6.62	-0.29	1440829	743362	1038162	+294800	-1374265	-402667
Siberian Federal District	7.19	11.63	5.84	7.67	+1.83	-3.96	+0.48	1102370	693700	773003	+79303	-804494	-329367
Central Federal District	6.63	12.55	6.17	6.87	+0.70	-5.68	+0.24	652649	1054682	445275	+34157	-609407	-207374
Volga Federal District	9.11	12.71	5.82	6.76	+0.94	-5.95	-2.35	555644	871830	463107	+189671	-408723	-92537
Southern Federal District	6.92	12.64	5.61	5.92	+0.31	-6.72	-1.00	241958	385589	128820	+10858	-256769	-113138
North Caucasian Federal District	3.24	3.03	3.19	5.16	+1.97	+2.13	+1.92	181143	155956	280709	+166857	+124753	+99566

* Ranked in descending order of the share of votes cast for the “Just Russia – Patriots – for the Truth” party in 2021.

The support for the “Just Russia – Patriots – for the Truth” party in the 2021 election compared with the previous elections to the State Duma has not changed significantly. A slight increase (1–2 p.p.) is observed in all federal districts, except the Ural Federal District. We note a nationwide increase by 1.2% of the vote (or 0.9 million people).

Just Russia significantly worsened its position compared to the 2011 parliamentary election (the share of those who voted for this party in 2021 decreased by almost 6 p.p., or 4.5 million Russians, it is observed in all federal districts except the North Caucasian).

However, in general, over the period from 2007 to 2021, the party managed to maintain a fairly stable level of support (approximately 7.5%, although it is less by 1.2 million votes).

Following the results of the vote, the New People party appeared in the State Duma for the first time. Apparently, the fact that the party was able to overcome the 5% barrier in most RF constituent entities (58) indicates that its program¹² reflects the interests of a certain part of Russia's population, primarily young people, who act as the "main force of the party"¹³.

"The success of the New People [Novyye lyudi] party is explained in different ways. One of the reasons can be that this political project has an advantageous name, which resonated with the people who were tired of the irremovability of the establishment. Another explanation is that **New People met the expectations of market supporters and business for a moderately liberal party**"¹⁴.

In particular, the State Duma has become more balanced after it included the New People party in its composition. According to experts, "following the results of the September election, the State Duma now consists of two accumulating structures. They include the party that attracts the extreme left-wing post-Soviet populism, that is, the Communist

"A parliamentary billet is being constructed, within the framework of which it would be possible to carry out party and personnel modernization without the loss of manageability ...

The presidential administration has already taken over the personnel issue... here we see a long-term governmental strategy to form a meritocratic corps of managers, governors, officials – and now politicians"¹⁵.

Party, and the new right-wing parties, whose task is to support liberal shifts and unpopular reforms"¹⁶.

Thus, perhaps the main outcome of the latest State Duma election consists in the fact that its result reflects objective trends in Russia's public sentiment. This includes strengthening civic consciousness, defining clear boundaries of the socio-political consensus based on the priority of national interests and the basic values of the welfare state, and strengthening the role of young generations in shaping the political agenda.

Apparently, such a result was achieved mainly due to the efforts undertaken by V. Putin and his team, who tried to reduce the severity of internal and external force majeure factors as much as possible. First, they managed to ease international political tension around Russia; second, they prevented possible attempts of the non-systemic opposition (the "fifth column") to discredit the results of the vote.

We should note that the initiatives and management decisions taken by V. Putin are aimed at the long-term perspective, at the future generations of Russians. In this sense, such significant moments of modern Russian history as the 2007 Munich speech of the President, the accession of Crimea and Sevastopol to the Russian Federation, the amendments to the 2020 Constitution, etc., perform the same role as the "less visible" decisions adopted by V. Putin or his ideological associates from the patriotic, nationally oriented bloc (for example, arrests of regional level leaders¹⁷; personnel changes in key positions responsible, in particular, for the

¹² The agenda of the New People party includes, in particular, ideas such as supporting innovation, reducing pressure on business, raising teachers' salaries, reducing the amount of paperwork and reporting for doctors, voluntarily passing the Unified State Exam, reducing state control over the economy, introduction of business education at secondary schools, transferring powers and resources to local elites, abolishing censorship and punishment for extremism, etc.

¹³ The New People party presented its election program. *ORT News*. August 23, 2021. Available at: https://www.ltv.ru/news/2021-08-23/411843-partiya_novye_lyudi_predstavila_predvybornuyu_programmu

¹⁴ What does the success of the New People party mean? *Nezavisimaya gazeta*. September 20, 2021. Available at: https://www.ng.ru/editorial/2021-09-20/2_8256_editorial.html

¹⁵ A parliamentary billet. *Ekspert*, 2021, no. 38, September 13–19.

¹⁶ Is the Duma moving toward a three-party system? *Nezavisimaya gazeta*. October 4, 2021. Available at: https://www.ng.ru/editorial/2021-10-04/2_8268_editorial.html

¹⁷ Read more about this in: Ilyin V.A., Morev M.V. Russian statehood in the face of the "corruption of the elites" threat. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz*, 2020, vol. 13, no. 6, pp. 24–53.

development of the education and upbringing system, which is designed to ensure a high moral level of the younger generations¹⁸, etc.).

All these steps, as well as the creation of the most peaceful internal and external political

“According to the Prosecutor General’s Office of the Russian Federation in 2020 “**949** law enforcement officials, **539** officials of state and local government bodies, **58** deputies of the regional and municipal level who committed corruption-related crimes have been convicted”¹⁹.

“In total, 34 heads of regions, including 19 in office, have been prosecuted in Russia since 1996... **ten governors were convicted in the past five years**”²⁰.

situation during the State Duma election, the situation that allows Russian citizens to make the most informed and verified choice in accordance with their internal needs and beliefs, are consistent elements of a unified whole – the construction of a new Russian statehood, the main postulates of which were outlined by V.V. Putin in his 1999 article “Russia at the turn of the Millennium”.

Other concrete steps taken by the President himself and his associates, who share state priorities in the administration system were aimed at building a “strong state” and “forming an integral system of state regulation of the economy and social sphere”.

Keynotes of V.V. Putin’s article “Russia at the turn of the Millennium”²¹ (1999):

“Achieving the necessary growth dynamics is not only an economic problem. This is also a political problem and, I dare say, in a certain sense, an ideological one. More precisely, an idea-driven, spiritual, moral problem.

Chances for a decent future:

A) The Russian idea. Fruitful creative work, which our Fatherland needs so much, is impossible in a society that is in a state of disruption, that is internally divided... The main point of consolidation of Russian society is what we can call the primordial, traditional values of Russians: patriotism, sovereignty, statesmanship, social solidarity.

B) A strong state. We are at a stage when even the most correct economic and social policy fails due to the weakness of the state authorities and governing bodies. The key to the revival and rise of Russia today lies in the state-political sphere. Russia needs a strong state power and must have it. This is not a call for a totalitarian system... A strong state power in Russia is a democratic, legal, capable federal state.

C) Efficient economy.

1. I think that one of the main lessons consists in the fact that throughout all these years we have been moving gropingly, at random, without clear ideas about national goals and frontiers that will ensure Russia’s position as a highly developed, prosperous and great country. The absence of such a promising development strategy designed for 15–20 years or more is particularly acute in the economy... The country needs a long-term national development strategy.

¹⁸ For example: the change of the rector of the Higher School of Economics (the new head is N.Yu. Anisimov, former rector of the Far Eastern Federal University); change of the president of the Russian Academy of Education (the new president is O.Yu. Vasil’eva), etc. Read more about this in: Ilyin V.A., Morev M.V. National Security Strategy – 2021: Positive experiences and conflicting expectations. *Ekonomicheskie i sotsial’nye peremeny: fakty, tendentsii, prognoz*, 2021, vol. 14, no. 4, pp. 9–32.

¹⁹ *News Polit.ru*. February 24, 2021. Available at: <https://polit.ru/news/2021/02/24/gubernatory>

²⁰ Interview with V. Baldin, head of the Department for supervision of the implementation of anti-corruption legislation of the Prosecutor General’s Office of the Russian Federation. *RIA Novosti*. March 9, 2021. Available at: <https://ria.ru/20210309/korrupsiya-1600432034.html>

²¹ Putin V.V. Russia at the turn of the Millennium. *Nezavisimaya gazeta*. December 30, 1999. Available at: https://www.ng.ru/politics/1999-12-30/4_millennium.html

2. The second important lesson of the 1990s is the conclusion about the need for Russia to form an integral system of state regulation of the economy and social sphere... The point is to make the Russian state an effective coordinator of the economic and social forces of the country, building a balance of their interests, determining optimal goals and parameters of social development, creating conditions and mechanisms for their achievement.

3. The third lesson is the transition to the implementation of a reform strategy that would be optimal for the conditions of our country.

4. We cannot but see that for Russia, any transformations and measures that involve deterioration in people's living conditions are practically out of the question".

First of all, this applies directly to the State Duma elections. For example, if in the 2016 parliamentary election the President of the Russian Federation and his All-Russian Popular Front distanced themselves from United Russia (which, according to experts, became one of the factors contributing to a decline in the electoral ratings of the party in power²²), then in 2021 the situation has changed dramatically. Experts note that "at the last stage, the President actually led the United Russia campaign"²³, and V. Volodin, Speaker of the State Duma, openly stated that the "high result of United Russia" is due to the support of Vladimir Vladimirovich Putin"²⁴.

In June 2021, the head of state participated in the 20th Congress of United Russia and presented five of its leaders (S. Shoigu, S. Lavrov, E. Shmeleva, D. Protsenko, A. Kuznetsova) who became the "face" of the party, replacing Dmitry Medvedev (who performed the role in 2016).

After the announcement of the final results of the voting, the President has initiated the creation

of five party commissions²⁵, which, according to the head of state, "will help to build the work so that

K. Kostin (Chairman of the Board of the Civil Society Development Fund): "The party has always had separate commissions and projects at different levels, **but the current commissions are structures of a different level**, among other things because they are headed by political heavyweights.

The new commissions will not duplicate the work of existing authorities, for example, the Ministry of Health or the State Duma Education Committee. **They will become points of coordination of various branches of government.** The fact is that United Russia is not only a legislative power at the State Duma level, and not only an executive power at the governmental level. United Russia also includes regional authorities (governors, legislative assemblies). And their work must be brought together. **Do not forget about responsibility. The President, as the leader of the party, and its top five members symbolize this responsibility"**²⁶.

²² See for example: Mukhametov R.S. Regional Election—2016. Available at: https://urgi.urfu.ru/fileadmin/user_upload/site_15017/politkaf/Doc/Regionalnye_vybory-2016.pdf

²³ Rodin I. After the election, the power vertical will be renovated... *Nezavisimaya gazeta*, 2021, October 3. Available at: https://www.ng.ru/week/2021-10-03/8_8267_politweek.html

²⁴ TASS news. September 20, 2021. Available at: <https://tass.ru/politika/12455503>

²⁵ At the suggestion of the President, "S. Shoigu will head the commission on the development of Eastern Siberia. S. Lavrov – the commission on international cooperation and support of compatriots abroad. E. Shmeleva will head the commission on education and science, D. Protsenko – on healthcare. A. Kuznetsova – the commission on the protection of motherhood, childhood, and family protection. And it will directly coordinate this direction in the State Duma" (Source: The leaders of the United Russia electoral list will head specially created party commissions. *Official Website of the United Russia Party*. September 27, 2021. Available at: <https://er.ru/activity/news/vladimir-putin-pyaterka-spiska-edinoj-rossii-vozglavit-specialno-sozdannye-partijnnye-komissii>).

²⁶ A political scientist explained why United Russia created party commissions. *Komsomolskaya Pravda*, 2021, September 28. Available at: <https://www.kp.ru/daily/28336/4481728>

all the instructions of the voters and the people's program of the party are fully implemented"²⁷.

According to political scientists, in this way, "points of coordination of various branches of government" were created, which, obviously, was another step in streamlining the entire system of public administration under the direct leadership of the head of state.

Apparently, a series of V.Putin's personal meetings with leaders of the Duma factions was aimed at addressing the same task, which experts assessed as "setting up the Lower House for constructive work"²⁸.

In addition, on September 27, 2021, United Russia deputies A.A. Klishas and P.V. Krashe-ninnikov (who were part of the working group on the preparation of proposals for amendments to the RF Constitution) **submitted a draft law "On a unified**

system of public power" (USPP) to the State Duma; the draft law, in particular, involves the abolition of the limit on the number of terms for the election of governors, but most importantly (as experts note) – actually leaves the role of "the only real manager" to the President, and turns everyone else into "hired managers"²⁹.

It is also important to note that on the same day (September 27, 2021), a regular meeting of the Security Council was held, at **which V.V. Putin initiated a discussion of the main directions for improving the strategic planning system.** The head of state noted that "we need a **balanced, consistent and integrated strategic planning system** to create up-to-date and well thought-out plans and programs to achieve specific results. Our planning system should encourage all government bodies, civil society in general, and the business community to follow

K. Kalachev (Head of the Political Expert Group): "The law on USPP is the cherry on the cake; all **these years, in fact, we were witnessing defederalization and the formation of a unitary centralized state, it remains only to formalize it legislatively.** The government seeks to adjust all regions to unification, despite local and national specifics; they are being levelled regardless of their differences, in order to strengthen control. At the same time, there is a goal to secure the opportunity for governors, who are effective from the Kremlin's point of view, to continue what they started. And to be re-elected in order to hold the election of 2024 peacefully, since, apparently, according to the estimates of the supreme power, many regions in which the powers of their heads are about to expire successfully coped with the elections of this year and withstood some kind of stress test. **And it is important that regions have no vacillations associated with a possible reboot of the system – the governors have received a clear message that horses won't be changed in midstream**". At the same time, the expert noted that it does not matter whether this initiative was intended for the President or for his successor, since **the chosen course of strengthening the vertical of power is being continued, any possibility of turbulence should be eliminated**"³⁰.

"The first reading of the draft law on public authority has already been scheduled for November 9... **it is quite obvious that the customer of the Klishas-Krasheninnikov draft law is the presidential administration, which carries out the instructions of the leader of the country. Judging by the text of the document, the main thing was to fulfill this instruction as soon as possible...**

One of the novelties of the future law is to create such conditions for interaction between the executive and representative authorities in regions, which in case of conflicts will lead them to dead ends, **which only the President of the Russian Federation or the State Council on his behalf will be able to overcome**"³¹.

²⁷ V. Putin's speech at a meeting with the leaders of the election list of the United Russia party. Official Website of the RF President. September 27, 2021. Available at: <http://www.kremlin.ru/events/president/news/66775>

²⁸ Garmonenko D. Putin will personally set up the work of the parliament. *Nezavisimaya gazeta*. October 5, 2021. Available at: https://www.ng.ru/politics/2021-10-05/3_8269_putin.html

²⁹ D. Garmonenko The Kremlin has begun to overhaul the power vertical. *Nezavisimaya gazeta*. September 27, 2021. Available at: https://www.ng.ru/politics/2021-09-27/1_8262_president.html

³⁰ *Ibidem*.

³¹ Rodin I. The State Duma is being turned from a printer into a copier. *Nezavisimaya gazeta*. October 4, 2021. Available at: https://www.ng.ru/politics/2021-10-04/1_8268_printer.html

the same logic and achieve priority goals together for the sake of a successful, prosperous future in Russia”³².

“The Government has prepared the Integrated Plan to achieve the national development goals... I would like to thank my colleagues from the Government and, considering today’s conversation, do the following.

First, bring all the indicators of the Integrated Plan in line with the results of 2020 in order to fully consider the significant changes that have taken place both in Russia and all over the world.

Second, it is necessary that our goals and indicators for the upcoming period until 2024 are in line with the level we are starting from.

Third, I would like to ask you to outline the specific plans and results that will be achieved in the next three years on every national goal based on the prepared Integrated Plan, so we can review them after 2023”³³.

Recall that Vladimir Putin spoke about the need to improve the strategic planning system at a meeting of the State Council in December 2020, after which some experts noted that Russia, in fact, “is reviving Gosplan on the example of the USSR”, and “the initiative to revive Gosplan in the country belongs personally to the President of Russia”³⁴.

However, in September 2021, after the adoption of a new National Security Strategy and the successful implementation of the parliamentary election, the task of improving the strategic planning system was set by the President in a new, more specific form. Thus, the participants of the Council considered the draft “Fundamentals of state policy in the field of strategic planning in the Russian Federation”, which (according to the Secretary of the Security Council N. Patrushev) is scheduled

to be submitted to the head of state for approval in November 2021³⁵.

Thus, over the past months, we see a clear course of actions taken by the RF President so as to strengthen the internal foundations of Russian statehood, which is a logical continuation of his initiative to amend the RF Constitution.

Today, some signs of a “recovery” in the administration system are already evident. Thus, a number of experts express a cautious “hope that the Mishustin government has become stronger to such an extent that it will really begin to limit the arbitrariness of the monopoly”³⁶. This happened after the decision was made to increase the tax on excess profits for the oligarchs. “A very serious step has been taken, and what is absolutely and fundamentally important – it has been taken upon the consent of the parties”³⁷.

“For quite a while, there has been an ongoing discussion concerning the desire of the Mishustin government to deprive the oligarchs of the part of the super profits they receive due to favorable economic conditions. The discussion went on for a long time, various statements were made, and here is the conclusion: the government will introduce an excise tax on steel – 2.7% and change the calculation of the mining tax, not only for ore, but also for coal and fertilizers. As a result, the level of withdrawal of natural rent in the relevant industries from the beginning of next year will reach a level that is officially recognized as the global average. That is, they discussed the problem regarding metallurgists, and during the discussion they expanded the scope of raising the tax on excess profits to include coal oligarchs and oligarchs who produce fertilizers”³⁸.

³² Vladimir Putin’s speech at a meeting of the Security Council on September 27, 2021. *Official Website of the RF President*. Available at: <http://www.kremlin.ru/events/president/news/66777>

³³ *Official Website of the RF President*. Available at: <http://www.kremlin.ru/events/president/transcripts/64736>

³⁴ Khazin. Putin revives Gosplan in Russia. January 1, 2021. Available at: <https://www.9111.ru/questions/777777771158001>

³⁵ A digital strategic management platform is being created in Russia. *Rossiyskaya gazeta*. September 27, 2021. Available at: <https://rg.ru/2021/09/27/patrushev-v-rf-sozdaetsia-cifrovaia-platforma-strategicheskogo-upravleniia.html>

³⁶ Delyagin. How Mishustin persuaded the oligarchs to share. *Zavtra*, 2021, October 1.

³⁷ *Ibidem*.

³⁸ *Ibidem*.

However, there still remains a full range of tasks that the President has to address; and the goals he set for himself in 1999 are yet to be achieved. Apparently, this work will continue after 2024, when the next presidential election will take place in Russia.

High-profile corruption scandals are still breaking out in the administration system. Moreover, it is noteworthy that the persons involved in them are directly related to the system responsible for the upbringing of the younger generations – not only for their educational potential, but also their moral and ethical level.

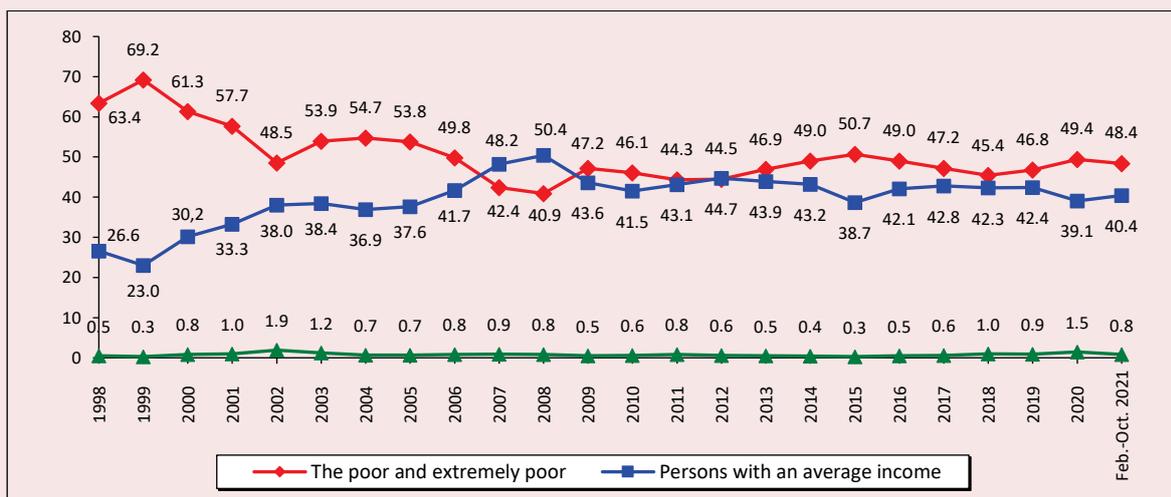
The dynamics of subjective assessments of the population regarding their own financial situation have not shown steady positive changes for many years; this fact obviously plays a key role in reducing support for the party in power in the long-term (over the past 14 years) and short-term (over the past 5 years) dynamics.

Even in the “pre-covid” period (actually since 2013), according to the results of a long-term sociological monitoring, the proportion of people considering themselves “poor and extremely poor” exceeded the proportion of people with “average earnings” (Fig. 2).

In October 2021, former Vice President of Sberbank, **Ex-Deputy Minister of Education of Russia Marina Rakova (who held this position in 2018–2020)** was charged with fraud. The case against Rakova was initiated on the fact of embezzlement of budget funds during the implementation of the state program “Education” in 2019, **when she was Deputy Minister of Education**. Suspicions were raised after an expertise that revealed inconsistencies in the performance of the work under state contracts. The damage caused to the state, according to the investigation, amounted to 50 million rubles. Other defendants in the case included S. Zuev (rector of Moscow Higher School of Social and Economic Sciences of a non-state university, better known as Shaninka), K. Kryuchkova (executive director of Shaninka) and a number of other persons.

As experts have noticed, **“under Rakova, the contractor of the project “Teacher of the future” within the framework of the Russian national project “Education” was a non-governmental university that works closely with the UK. If someone starts testifying, it may turn out that the “Teacher of the future” cost the government even more than the fifty million rubles already stolen”³⁹.**

Figure 2. Dynamics of social self-identification, percent of respondents



Question: “What category do you belong to, in your opinion?”
 Source: VoIRC RAS public opinion monitoring.

³⁹ The rector’s case: What role Sergey Zuev could play in Rakova’s scheme. *Vesti*. October 12, 2021. Available at: <https://www.vesti.ru/article/2625574>

Many important points that characterize the current socio-political situation in the country also manifested themselves during the State Duma election. Moreover, they are noted at all territorial levels (federal, regional, municipal), which indicates their complex, system-wide and long-term nature.

The analysis of Central Election Commission data shows that voter turnout at parliamentary elections is significantly lower than for presidential elections or for the all-Russian referendum on amendments to the Constitution. For example, at the 2016 and 2021 State Duma elections, the turnout was 48–52% (53–57 million people); at the latest presidential election (2018) and the all-Russian vote on constitutional amendments (2020) the turnout was 68% (74 million people; *Insert 7; Tab. 4*).

The same applies to the support for the government represented, on the one hand, by the United Russia party, on the other hand, personally by V.V. Putin (at the presidential election) and the amendments he proposed to introduce to the Basic

Law (at the all-Russian referendum in 2020): 50–54% voted for United Russia in the parliamentary elections of 2016 and 2021 (28 million people); 77% voted for V.V. Putin in the 2018 presidential election and for amendments to the Constitution in 2020 (see *Insert 7; Tab. 4*).

Thus, Central Election Commission data show that presidential elections attract much more attention of the population than parliamentary elections; in our opinion, this indicates that Russians hope and expect that the head of state take decisive action in addressing the most critical issues. Some experts note that “it is President Vladimir Putin that is the main and ideally the only real politician in Russia”⁴⁰.

Amendments to the Constitution concerning the distribution of powers between the authorities⁴¹, the emergence of the “right wing”, the New People party, in the State Duma – these events apparently can be considered as steps toward the creation of an extensive, balanced and stable system of public administration. Moreover, these steps certainly have

Table 4. Voter turnout dynamics at key elections at the federal level

Voter turnout and support for the authorities 2007		State Duma elections				Presidential election	All-Russian vote on amendments to the Constitution
		2007	2011	2016	2021	2018	2020
Turnout	%	63.78	60.21	47.88	51.72	67.54	67.97
	million people	69.6	65.8	52.7	56.5	73.6	74.2
Support for the authorities*	%	64.30	49.31	54.20	49.82	76.64	77.92
	million people	44.7	32.4	28.5	28.1	56.4	57.8

* Support for the United Russia party in the elections to the State Duma; support for V.V. Putin in the RF presidential election; support for amendments to the Constitution in the all-Russian referendum.
Calculated according to the RF Central Election Commission database. Available at: <http://www.vybory.izbirkom.ru/region/izbirkom>

⁴⁰ About the State Duma and the principle of selfless voting. *Nezavisimaya gazeta*. October 7, 2021. Available at: https://www.ng.ru/editorial/2021-10-07/2_8272_editorial.html

⁴¹ For example:

- ✓ **expanding the powers of the President** (the head of state personally appoints and dismisses federal ministers, the Prosecutor General of the Russian Federation and his deputies; exercises general leadership of the Government); changes the role of parliament (the State Duma participates in the formation of the Government; the candidacy of the Prime Minister must be approved by the State Duma, and the President has no right to reject the approved candidate);
- ✓ **strengthening the role of the Constitutional Court of the Russian Federation** (it gets the right to check the draft law for constitutionality at the request of the President);
- ✓ **granting the Federation Council the authority to dismiss judges of the Constitutional Court of the Russian Federation and the Supreme Court of the Russian Federation;**
- ✓ **introducing the concept of a unified system of public power, etc.**

potential that will fully reveal itself in the future. But so far, this task still requires a solution, and it is not clear how it will be addressed further.

In addition, calculations carried out according to official CEC data in cities with major metallurgical corporations have shown that negative trends in long-term dynamics are more pronounced at the municipal level than at the national average, federal district, or regional levels.

For example, during the period from 2007 to 2021, there was a decrease in the turnout at parliamentary elections and support for United Russia:

- ✓ in Lipetsk by 20–24 p.p., and in the Lipetsk Oblast as a whole by 12–14 p.p.;
- ✓ in Magnitogorsk by 25–31 p.p.; in the Chelyabinsk Oblast by 21–27 p. p.;
- ✓ in Cherepovets by 23–27 p.p.; in the Vologda Oblast by 19–26 p.p. (*Insert 7; Tab. 5*).

At the same time, we should note that during the period from 2007 to 2021 in all three analyzed cities, both the turnout and the support for the party in power decreased more dramatically (by 20–30 p.p.) than in the country as a whole (by 12–15 p.p.).

Thus, different methods reflecting the dynamics of public opinion (which include the results of sociological surveys, expression of the will of the people at elections and referendums of various levels) prove that the historical goals that V.V. Putin has been trying to achieve consistently throughout his presidential terms still require considerable effort and time.

First of all, this concerns poverty whose dynamics have produced no positive changes for many years; this fact gradually leads to a loss of people’s trust in the party of power (as evidenced by the loss of 17 million votes by United Russia in parliamentary elections over the past 14 years) and forces the head of state to recognize low incomes of Russians as “our main enemy and threat”.

“Our country, and hence all of us, are facing many difficult challenges. I will repeat that **the low average income of our citizens, of millions of people, is our main enemy, a threat to steady development and our demographic future**”⁴².

Table 5. Dynamics of the voting results (turnout and support of the party in power) in the elections to the State Duma of the 5th and 8th convocations

Territory	Dynamics (+ / -), 2021 compared to 2007			
	Turnout		Support for the United Russia party	
	%	people	%	people
Russia	-12.06	-13124761	-14.48	-16650041
Northwestern Federal District	-15.85	-1780948	-22.08	-1893983
Vologda Oblast	-18.93	-217121	-26.07	-241500
<i>Cherepovets</i>	-23.09	-63808	-26.62	-65399
Central Federal District	-12.36	-7219676	-15.37	-4009647
Lipetsk Oblast	-12.42	-131879	-13.62	-147954
<i>Lipetsk</i>	-20.40	-80140	-24.40	-78361
Ural Federal District	-17.78	-1696610	-23.36	-2245245
Chelyabinsk Oblast	-20.72	-643878	-26.95	-715629
<i>Magnitogorsk</i>	-25.39	-92853	-31.09	-104466
Calculated according to the RF Central Election Commission database. Available at: http://www.vybory.izbirkom.ru/region/izbirkom				

⁴² Vladimir Putin’s speech at a meeting with deputies of the State Duma of the eighth convocation. *Official Website of the RF President*. October 12, 2021. Available at: <http://www.kremlin.ru/events/president/transcripts/66905>

Insert 7

DYNAMICS OF THE TURNOUT AT THE ELECTIONS TO THE STATE DUMA OF THE 5TH–8TH CONVOCATIONS, THE 2020 ALL-RUSSIAN VOTE ON AMENDMENTS TO THE CONSTITUTION AND THE 2018 PRESIDENTIAL ELECTION, %

Territory	Turnout at the State Duma elections					Dynamics (+ / -), 2021 to ...	Turnout at the voting on amendments to the Constitution	Dynamics (+ / -), 2021 State Duma election to the amendments to the Constitution	Turnout at the 2018 Russian presidential election	Dynamics (+ / -), turnout at the 2021 State Duma election to the 2018 Russian presidential election
	Year									
	2007	2011	2016	2021	2016					
TURNOUT										
Russia	63.78	60.21	47.88	51.72	-8.49	-12.06	67.97	-16.25	67.54	-15.82
<i>Vologda Oblast</i>	64.46	56.33	40.86	45.53	-10.80	-18.93	58.72	-13.19	66.20	-20.67
<i>Cherepovets</i>	65.19	55.49	38.29	42.09	-13.40	-23.09	48.10	-6.01	69.30	-27.21
<i>Lipetsk Oblast</i>	65.14	56.91	52.59	52.72	-4.19	-12.42	66.31	-13.59	72.16	-19.44
<i>Lipetsk</i>	57.27	50.64	42.76	36.87	-13.77	-20.40	44.19	-7.32	62.94	-26.07
<i>Chelyabinsk Oblast</i>	67.26	59.67	44.39	46.54	-13.13	-20.72	65.88	-19.34	66.41	-19.87
<i>Magnitogorsk</i>	73.26	66.18	48.96	47.87	-18.31	-25.39	59.64	-11.77	70.28	-22.41
PROPORTION OF VOTES CAST FOR UNITED RUSSIA, FOR AMENDMENTS TO THE CONSTITUTION, FOR V.V. PUTIN										
Russia	64.30	49.31	54.20	49.82	-4.38	-14.48	77.92	-28.1	76.64	-26.82
<i>Vologda Oblast</i>	60.47	33.40	37.40	34.40	-3.00	-26.07	71.16	-36.76	72.34	-37.94
<i>Cherepovets</i>	59.99	30.62	40.96	33.37	-7.59	-26.62	66.75	-33.38	73.24	-39.87
<i>Lipetsk Oblast</i>	62.30	40.09	56.01	48.68	-7.33	-13.62	78.56	-29.88	80.82	-32.14
<i>Lipetsk</i>	53.82	28.77	37.80	29.42	-8.39	-24.40	64.70	-35.28	73.66	-44.24
<i>Chelyabinsk Oblast</i>	61.14	50.07	38.15	34.19	-3.96	-26.95	69.54	-35.35	72.97	-38.78
<i>Magnitogorsk</i>	62.23	61.17	36.89	31.14	-5.74	-31.09	63.93	-32.79	70.89	-39.75

Since 2011, the turnout at the elections to the RF State Duma does not exceed 60%. For comparison, at the latest presidential election, as well as at the all-Russian vote on amendments to the Constitution, the turnout was 68%. In municipalities where large, backbone metallurgical enterprises are located (such as PAO Severstal, Novolipetsk Steel, and Magnitogorsk Iron and Steel Works), the difference between the turnout at presidential elections and parliamentary elections is even greater. Thus, in Lipetsk, the turnout at the elections to the State Duma of the 8th convocation proved 26 p.p. less than for the 2018 presidential election; in Magnitogorsk – 22 p.p. less.

The share of Russians voting for the United Russia party in the State Duma elections has been 50–54% since 2011. For comparison, 77% voted for Vladimir Putin in the 2018 presidential election, and 78% voted for amendments to the Constitution in the all-Russian vote of 2020. In other words, the head of state and his own initiatives find much higher support in Russian society than the party in power. On average in Russia, 27% fewer people voted for the party in power in the election to the State Duma of the 8th convocation than for V.V. Putin in the 2018 presidential election (that is, their number reduced by 28 million people). In the analyzed cities, this difference is even more pronounced: in Cherepovets – by 40 p.p., in Lipetsk – by 44 p.p., in Magnitogorsk – by 40 p.p.

The second key problem logically proceeds from the first one: apparently, the system of public administration created over the past 20 years fails to cope with the problem of poverty, which means that this system needs to be changed. Maybe this change should not be comprehensive and radical, but (in the President's usual way) careful, consistent and to the point.

At the same time, the work of the head of state aimed at making appropriate personnel decisions, as well as his initiatives on reforming **the system foundations of public administration and Russian society itself**, is largely dictated by the time factor – the need to get as close as possible to achieving the goals set in 1999 while the President remains the central figure (moderator) in the system of public administration. After Russian society supported the constitutional amendment on the “zeroing” of presidential terms, the severity of this issue somewhat reduced, but did not disappear completely.

The tasks set by the President (to strengthen traditional values in society; reform the system of public administration; ensure a steady upward trend in the standard of living and quality of life (primarily in the subjective assessments of the population); to achieve a geopolitical status of Russia as a stable, sovereign state respected by foreign partners; ensure its energy and territorial security for the long term) are of a historical nature; therefore, addressing these tasks is not limited to 2024, 2030, or any other year when presidential elections will be held and there is a chance that V.V. Putin may leave the post of head of state.

The task for Vladimir Putin personally is to “hand over” the country to his successor in a condition that corresponds to the ideological guidelines he set out in 1999 and consistently defended throughout the following decades. By the

way, they showed the consistency of the ideas of a “humanistically active social state”, expressed in the priority of the “concept of the dignity of man and citizen”⁴³, as well as traditional values as the basis for consolidation of Russian society; today they determine the boundaries of socio-political consensus, that is, the needs of society on the one hand, and the goals of state policy on the other.

What beliefs will Vladimir Putin's successor adhere to? Will he/she be able to maintain the high standard set by the President's actions in the domestic and foreign political arena (especially in the assessments of Russian society)? These are the questions that cannot be answered today; therefore, this requires the political administration system to be all set for overcoming any obstacles to the progressive development of Russia.

“We may say that current Russian society is in as hybrid-transitional condition, and its economy is a mixed one, dominated by a modernized, but still peripheral oligarchic-corporate “capitalism for the elite”. This capitalism has basically exhausted its constructive potential, and Russian society needs to continue its post-socialist transformation into a new condition – the condition of a more civilized knowledge society. It has already entered in its preparatory phase, but its further movement has slowed down. In order to successfully continue the movement that has begun, it is necessary to implement “modernization for all”, and the social state, as a humanistically active state, can become its main actor in Russia... It is necessary to promote the main directions (spheres) of the humanistically active function of the state that consists in promoting the establishment of conditions that ensure a decent life and free development of a person, as well as regional communities and the whole society on the basis of the observance of human rights”⁴⁴.

⁴³ Lapin N.I. On the disclosure of the active humanistic function of the social state in Russia. *Vlast'*, 2019, vol. 27, no. 2, p. 9.

⁴⁴ *Ibidem*. P. 11.

In conclusion, we should abstract our mind from the title of the article for a while, since the parliamentary election is not the first one and not the last one for Russian society. It is important to emphasize another point – what deep changes taking place in the state, the country, the population are reflected in the results of the latest vote.

We think they indicate the following two things.

First, during the two decades of Vladimir Putin's presidential terms, the country has formed an ideological vector of movement that is shared by both society and the state. This is a vector toward a welfare state, nationally oriented values, and a sovereign foreign policy. Even despite the absence of an official ideology in Russia and the existence of a "sixth column" in the system of public administration, there is simply no other vector in modern Russia.

Second, it is premature to say that the transformation of Russian society (its historical transition from the Soviet to the post-Soviet formation) has been completed. This also applies to the system of public administration. It is not yet clear how the natural change of generations will affect them; what role the inevitable transit of presidential power will play in the country's history; whether the fate of the fifth column will befall the sixth column; when (and whether) the vector of Russians' subjective perception of the dynamics of the standard of living and quality of life will be reversed; whether Russia will be able to resist the powerful wave of cultural and spiritual and moral decay coming from the West; whether the anti-Russian nature of the policy of key foreign countries will ever be fundamentally overcome... All these are questions that must be

A.G. Dugin about the "sixth column":

"In our society, the fifth column usually denotes only those who oppose Putin openly and completely, those who support the United States and NATO; they are against Crimea, against Russia, against Russian identity, against sovereignty, against Eurasian integration, against Russia's strengthening as a world power. This is open and pure betrayal, if we consider it on the nationwide scale; and in relation to Putin, these are his open enemies. The sixth column implies those whom we cannot yet accurately define in our political dictionary: its representatives are for Putin and for Russia, but at the same time for a liberal, pro-Western, modernized and westernized Russia, for globalization and integration into the Western world, for European values and institutions; they strive to make Russia a prosperous corporation in a world where the rules and laws are set by the global West, of which Russia is destined to become part – on as worthy and profitable grounds as possible. The sixth column is not Putin's enemies, but his supporters. If they are traitors, it is not on the scale of the country, but on the scale of civilization..."⁴⁵

"The sixth column includes liberals and westerners who occupy a high position in the state – in the hierarchy, government, economy. They are no better than the fifth column. They also consider Russia to be the periphery of Western civilization, they also despise the people and the state, are just as cynical about Russian history and can't wait to return to the blessed 1990s.

The sixth column has been resisting Putin's course for a long time, but little by little it was forced to endure it. And even began to mumble sluggishly and insincerely about the "Crimean consensus"... And now we see how the direct adherents of globalization, Westernism, liberalism, and world hegemony are changing their ideological positions. They are already dressing up as "patriots" and wholeheartedly stand for sovereignty. And even if they do not do this and continue to express discontent – like Chubais, Kudrin or Gref, they do not directly oppose Putin, preferring to act surreptitiously"⁴⁶.

⁴⁵ Dugin A.G. The sixth column is the main existential enemy of Russia. *Eurasia*. September 21, 2016. Available at: <http://evrazia.org/print.php?id=2511>

⁴⁶ Dugin A.G. The sixth column in power cannot go together with the Russian future. *Official website of the Izborsk Club*. September 29, 2021. Available at: <https://izborsk-club.ru/21721>

answered; otherwise it will be impossible to say that the post-Soviet society has been formed, and Russia has occupied a stable and unique niche in a multipolar world.

“Of course, it is good that at the very top of the government and in the public discourse there is a strong traditionalist statist anti-liberal position. This is an absolute achievement of the period from 2014 to 2020. Some of the statements made on the main platforms of the country about the nationalization of the elites and mobilization were considered marginal until recently.

But when a word from high-ranking officials is not followed by a deed, it causes bewilderment and confusion among the people. I would very much like to hope that all this is a prolonged artillery preparation before historical changes and transition to full sovereignty, rather than an expression of the impotence of the healthy part of the government, which is in the minority; while the systemic liberals are quietly working on the decomposition of society in the interests of their “partners”⁴⁷.

Thus, the latest election to the State Duma of the 8th convocation, on the one hand, has demonstrated the growing discontent of Russians with regard to how the current party in power and the President are coping with key problems of concern to the population. On the other hand, society has given the head of state another “credit of trust”, hoping that through gradual reforms and personal initiatives he will be able to put the public administration system in order, as evidenced by steady positive changes in the dynamics of people’s subjective assessments of the state of the economy, their personal financial situation, the standard of living and quality of life in the country.

A. Ilnitskii (Adviser to the Minister of Defense of the Russian Federation, Full State Adviser of the 3rd class): “Today, Russia is at a crossroads, trying to determine the model of the future. Moreover, for us it can only be our own – inherent and sovereign – decision. **Meanwhile, all the post-Soviet years, Russia has been moving in the paradigm of a catching-up development, trying on Western democracy. Today, this model is “bursting at the seams” – the more important it is for Russia to find its way...**

Russia has exhausted the time and social resources of inertial development. It’s time for Big Decisions and Big Projects. What is the ideology of the Big Project? ([3 of 19 points]):

- ✓ crucial importance of the leading and organizing role of the state;
- ✓ the idea of a single economic plan for the country as a key organizing document for the revival and recreation of the domestic economy based on the synthesis of best aspects of state planning and market self-organization;
- ✓ **nationalization of the elites according to the principle “whoever is not with us is against us”. Those “who are not with us” must realize that they risk losing everything...”**⁴⁸

In fact, this is what Vladimir Putin said at a meeting with deputies of the State Duma after the final distribution of seats in parliament. **Noting the fact that “low incomes of our citizens, of millions of our people” are “the main enemy” and “a threat to stable development, to the demographic future”, he actually assessed himself, as well as the system of public administration he created with the use of a “hands-on approach”, at the same time focusing it on addressing the problem of poverty as its priority task.**

⁴⁷ Birov E. A word without a deed. *Zavtra*. October 12, 2021.

⁴⁸ Ilnitskii A.M. The time of Big Decisions. *Parlamentskaya gazeta*. September 23, 2021. Available at: <https://www.pnp.ru/politics/vremya-bolshikh-resheniy.html>

The very fact of such a direct and self-critical summing up testifies to the President's awareness of personal responsibility both for his work and for the work of United Russia, but the fact remains that in order to defeat the "main enemy", the President still has to make a lot of efforts (primarily in addressing the problem of nationalization of the elites) in order to reformat the system of public administration; so that the "point" personnel changes that are currently being observed have a truly comprehensive and system-wide effect.

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Rural Development in the Context of Spatial Compression of a Northern Region*



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Abstract. Ensuring balanced spatial development and reducing inter- and intra-regional imbalances are strategically important issues for Russia. However, finding a solution to these issues is complicated by the growing concentration of human, industrial, and scientific potential in large cities, major cities, and metropolises, depopulation and economic desertification of rural areas, that is, disintegration and compression of the country's economic space. This is especially acute in the northern regions of Russia. The aim of the article is to study the problems and determine the prospects for development of rural areas of the northern region in the context of spatial compression on the example of the European North of Russia. We point out that the social, economic, and infrastructural issues observed in rural areas have

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remained unresolved since the 1990s. Rural population decline caused by the destruction of the socio-economic potential of these territories is a key factor in the compression of the space of the northern region, degradation of the village and loss of its human capital. The reason lies not only in the shock transition to the market in the 1990s, but also in the ineffective state policy for rural development in the post-reform period, and in the absence of a strategic vision of the place of rural territories in the national space. Having analyzed the current state of the rural periphery and taking into account the need to shift to neo-endogenous rural development, we identify three priorities of state policy in the field of rural development in the North of Russia. They are as follows: development of the rural economy, modernization of rural infrastructure, and comprehensive development of human capital as the ultimate goal of all economic and social transformations. The findings of our work contribute to the formation of ideas about trends in spatial development of the northern regions of Russia and socio-economic issues of rural areas; they can be used by researchers in their studies on similar topics, and by public authorities when they need to work out strategic documents in the field of spatial development.

Key words: rural territories, northern region, economic space, disintegration, locational compression.

Introduction

The Russian Federation is a northern country; more than 60% of its territory is located north of the 60th parallel [1]. Historically, the interest in the Russian North, on the part of foreign countries as well, was due to the huge reserves of natural resources of the territory and the water area, the transit potential of the Northern Sea Route. However, today the North not only serves as a resource depository of Russia, but also performs recreational, defense and other functions. These and many other factors determine the preservation of the “northern” vector in the policy of the Russian Federation, which is aimed at the new exploration and retention of the space of the northern region; the vector can be traced in official documents of the federal and regional levels¹.

Despite the actively pursued state policy regarding the North and the Arctic, the development of these territories is going on unevenly: achievements of export-oriented industries, imbalances in living standards between village

and city, and the development of the economy, infrastructure, etc. are so prominent as they have never been before. In general, against the background of the overall development of the northern region achieved mainly due to the positive effects of urbanization, orientation of the economy toward exports and its dependence on natural resources, we can say that the northern village has practically become a “fabric”, a “neglected” area where social and economic activity is fading. Meanwhile, according to RAS Corresponding Member Doctor of Sciences (Economics) V.N. Lazhentsev and Doctor of Sciences (Economics) V.A. Ivanov, a crucial role in addressing the issues of sustainable functioning of the northern territories belongs to the improvement of the standard of living and quality of life of rural northerners and economic development of the northern village [2].

In this regard, the purpose of our work is to study the problems and determine the prospects for the development of rural areas in the conditions of spatial compression² of the northern region.

¹ Decree of the President of the Russian Federation “On the fundamentals of the state policy of the Russian Federation in the Arctic for the period up to 2035”, the Strategy for development of the Arctic zone of the Russian Federation and ensuring national security for the period up to 2035, etc.

² Here and further on, when speaking about spatial compression, we mean primarily locational shrinkage that is manifested in the loss of once inhabited and developed territories.

Materials and methods

Methodological basis of the research includes works of Russian and foreign scientists in the field of spatial and regional economics, and works on strategic management of the development of regions and rural areas. We also drew information from sources such as official websites of Rosstat and its territorial offices, state and municipal authorities, a survey of heads of municipalities of the Vologda Oblast conducted by VolRC RAS in 2020.

Along with the method of content analysis of scientific literature, we used generalization, analysis, synthesis, qualitative and quantitative data processing.

Theoretical aspects of the study

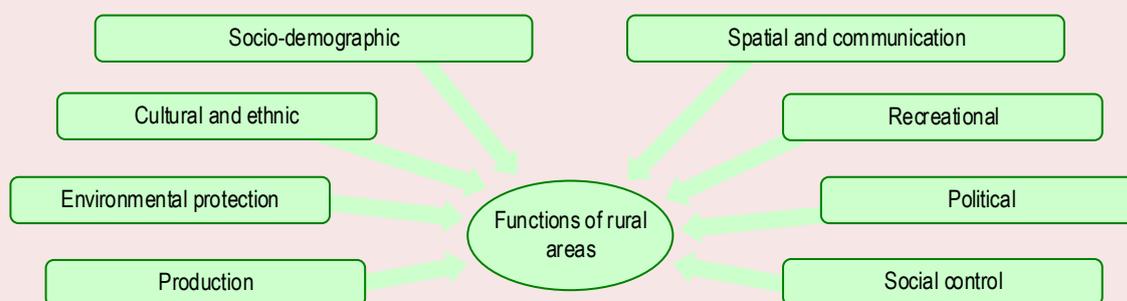
In the broadest sense, rural area (rural territories) is a “socio-economic, territorial, natural and historical-cultural complex that comprises rural population, a network of social and production relations connected with its functioning, and the territory and material objects located on it” [3]. The multifunctional role of rural territories lies in the fact that they are simultaneously a place of residence and recreation of their population, a site for production of food and agricultural products and implementation of other important economic functions (*Fig. 1*).

The extremely high contribution of the village to ensuring stable socio-economic and balanced spatial development makes it necessary to study rural areas comprehensively. In general, we can note that the issues concerning the role of rural territories, prospects and problems of their development are directly or indirectly considered in most major foreign and domestic theoretical developments on territorial and spatial development: standard theories, core-periphery models, growth poles theories, diffusion of innovations, zoning concepts, etc. [6–10].

Thus, according to the location theory developed by J.H. von Thünen, rural areas specialize in production of agricultural and forestry products and their sale to the city, this directly depends on the remoteness from the city, the amount of land rent and the prices for forest and agricultural products produced. At the same time, the development of rural areas is associated with the development of agriculture, forestry and other traditionally “rural” industries, that is, it has a clear sectoral orientation.

The ideas concerning the dependence of the role and specialization of rural territories on the location along the “core–periphery” line were further developed in the theories of cumulative

Figure 1. Functions of rural territories



Compiled with the use of [4; 5].

growth by W. Christaller, F. Perroux, T. Hägerstrand, etc. According to their basic provisions, as a result of the fact that growth centers are constantly being transformed under the influence of scientific and technological progress, obsolete industries are being displaced to the semi-periphery, and then, with a long time lag, to the distant rural periphery. Accordingly, specialization of the rural periphery is not limited only to the agricultural sector.

Meanwhile, it is possible to preserve and ensure the development of rural areas not only through the development of traditionally “rural” activities and the use of exogenous development factors. Based on the conceptual provisions of the new economic geography and the new growth theory, we can point out that a huge potential for the development of rural areas lies in the application of internal factors, including second-tier non-agglomerative factors.

In general, the views presented in different theories on the role of rural territories are reflected in practice in the models of rural development (*Tab. 1*). Undoubtedly, each of the models – exogenous, endogenous, and neo-endogenous – has its advantages and disadvantages. However, in modern conditions, when competition gives way to cooperation, and the economy of all levels – micro-, macro-, meso-, megaeconomics – is based on networks (cooperative, production, etc.), it is advisable to ensure integrated and stable rural development within the framework of a neo-endogenous development model.

At the same time, special attention in research on rural development is given to the northern village, which has a number of unique distinctive features. For example, in Russia it is “the location of settlements surrounded by forests, along rivers and lakes; small settlements, poor development

Table 1. Rural development models

Feature	Exogenous development	Endogenous development	Neo-endogenous development
Development principle	Using exogenous external development resources	Using endogenous local development resources	Reliance on local resources, but with an orientation toward the outside world and dynamic interaction between rural areas and between rural areas and their surrounding environment
The driving force of development	The driving force outside rural areas. Cities as growth poles, providing an impetus to the development of rural areas	The driving force within rural areas. Local initiative and entrepreneurship	The driving force consists in cultural, economic, institutional and other types of integration between urban and rural areas, and in strengthening their relations
Key functions	Production of agricultural, forestry and other products for the urban economy	Provision of various services	Preserving natural and human capital of rural areas
Development directions	Industrialization and specialization of agriculture; promotion of labor mobility and capital mobility	Development of internal potential (institutions, infrastructure, etc.); overcoming social isolation of rural areas	Decentralization of rural development management; building the capacity of local actors to manage larger processes and actions; positioning rural areas as places of production and catalysts for economic growth
Main problems	Dependence on external investments and subsidies; stimulation of certain sectors, settlements and certain types of businesses; neglect of non-economic aspects of rural life; development dictated by external experts	Limited opportunities for districts and social groups to participate in economic and development activities; this is usually due to the fact that preference is given to certain more influential social groups	Risk of formation of exclusive (privileged) rural areas; risk of inequality and asymmetry within the network; risk of imbalance of local and extra-local control; weakness of rural networks in the context of existing knowledge and capital
Compiled with the use of [11–15].			

of the network of road transportation links between cities and rural settlements; a low level of social cultural and consumer services; high unemployment and seasonality of agricultural and logging production” [16].

Thus, one of the major research areas for Russian and foreign scientists is the study of demographic, economic and infrastructural issues of northern rural territories in the context of achieving their sustainable development [17; 18]. A large number of scientific papers are devoted to the polarization of rural space, the interaction between rural and urbanized territories of the North, the search for some balance in the distribution of economic resources between them [19–22]. Scientists pay special attention to the issues of state regulation of development of the northern village and its economy, improvement of methodological approaches and mechanisms of their development taking into account northern climatic conditions [2; 23].

At the same time, the ongoing compression and polarization of the explored space³ against the background of a gradual transition to a neo-endogenous model have altered modern research discourse on rural development in the northern regions. Now the discussions on the subject proceed from the need to raise living standards, improve the quality of life and develop human capital in peripheral communities, rather than preserve rural settlements of the North as such or support

³ As noted in [24], when space is polarized, then “somewhere there is growth, and somewhere there is a decrease”, i.e. two poles are formed that are different in some way; in turn, when space is compressed, “the loser pole melts, because everything is gravitating somewhere toward the center”. That is, in general, compression and polarization are two different phenomena. At the same time, the works [24–26 et al.] present the facts that spatial compression and polarization have been among major trends in the development of Russia and its regions for 30 years. Despite the fact that the attitude toward these processes among the population, experts, and authorities is different, they are a reality that must be taken into account when developing and implementing the policy of socio-economic and spatial development of Russia.

northern fisheries and other economic activities⁴. Despite the fact that the scientific problem itself has not changed in its essence (the question of how to develop northern rural territories remains relevant), the conditions in which it is addressed have undergone radical transformations.

Major research findings

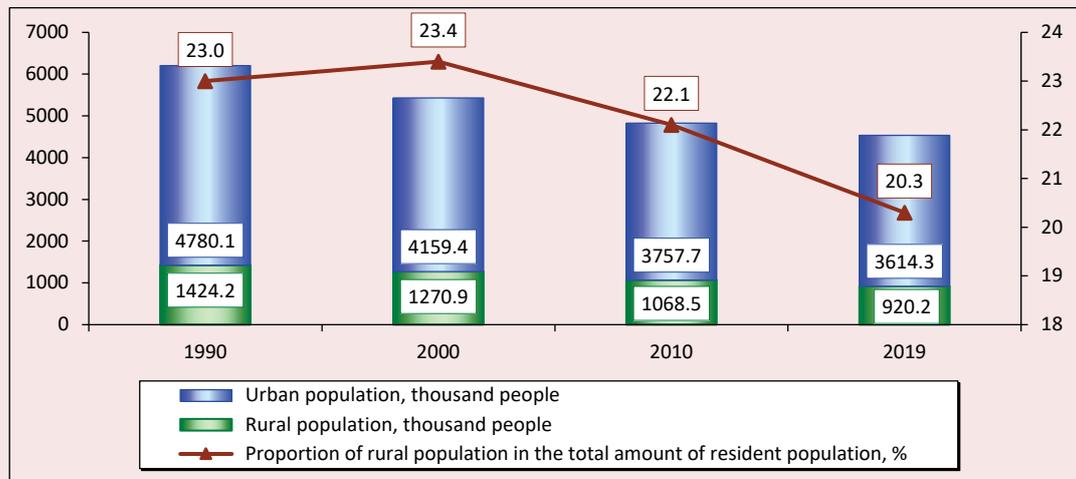
The market reforms of the 1990s had a significant impact on the transformation of the production and settlement frameworks of Russia and on the distribution of economic activity between territories. While large cities and agglomerations have strengthened their positions as centers of production, knowledge, and transport hubs, destructive processes and problems have intensified in the development of the rest of the territory; the problems include population decline, technological backwardness of industrial enterprises and a high level of depreciation of their fixed assets, destruction of social, transport infrastructure, etc. In the absence of any counterweights, such polarization of space entailed its locational compression and fragmentation. This is extremely acute today in the northern territories of Russia, where the pace of depopulation and economic desertification of rural periphery has acquired an unprecedented scale.

Using the example of the European North of Russia (ENR)⁵, a geostrategic region within the Russian Federation, we can clearly see the implications of uncontrolled rural compression.

⁴ At the same time, in the southern, central, and chernozem regions, the development of rural territories is still largely determined by agriculture due to more favorable natural and climatic conditions for its functioning.

⁵ The ENR includes the Vologda, Murmansk and Arkhangelsk oblasts, the Republics of Karelia and Komi, and Nenets Autonomous Okrug. The strategic importance of the ENR for Russia is due to the fact that, according to the Strategy for spatial development of the Russian Federation until 2025, it is a geostrategic territory (a significant part of it belongs to the Arctic zone of the Russian Federation); a buffer zone through which cooperation with European countries is carried out; here, the Northern Sea Route – one of the main international sea arteries – originates [27]. In addition, the subjects of the ENR have significant natural resource and production potential.

Figure 2. Population dynamics in the European North of Russia



Compiled with the use of EMISS data.

First, we should note deterioration of the demographic situation, accompanied by poverty and unemployment, low living standards and quality of life of the villagers, which led to the simplification of the settlement network and enlargement of its nodes.

Thus, in 1990–2019, there was a significant polarization of the settlement system in the ENR: against the background of general depopulation, the share and number of rural population decreased by 35.4% or 504.0 thousand people, accordingly (*Fig. 2*) due to the natural decline and migration outflow to Russia's large cities and megacities, administrative centers of constituent entities of the ENR, the Central, Northwestern and Volga federal districts [28]. In addition, the decline in the share of rural population is partly explained by changes in the administrative-territorial structure of the entities (changes in the status of settlements, etc.).

At the same time, the downward trends in the proportion and number of rural population are typical of all constituent entities of the ENR, with the exception of the Republic of Karelia, where in 1990–2019, according to Rosstat, the share of rural

population increased by 0.9 p.p. (due to higher rates of urban population decline).

Depopulation caused a change in the settlement framework. Despite the fact that according to the All-Russian Population Censuses for 2002–2010, the number of rural settlements in the regions was decreasing slightly, the share of actually “dying” villages (depopulated and with a population of less than 10 people) by 2010 varied within 18.6–66.9% (with the exception of Nenets Autonomous Okrug, in which among 41 settlements there was one settlement without any residents and two with a population of up to 10 people; *Tab. 2*). In fact, the settlement network in the North has significantly shrunk.

Further, the negative trends have continued. For instance, in the Vologda Oblast by 2020, the number of rural settlements decreased from 8,006 to 7,851 due to the fact that depopulated settlements had been removed from the register.

Meanwhile, at the level of constituent entities, the depopulation of rural space manifested itself with varying degrees of intensity, depending on the periphery of rural areas and the potential of nearby cities. Thus, in the Vologda Oblast, the largest

Table 2. Dynamics of the number of depopulated rural settlements and their share in the total number of rural settlements in the European North of Russia

Territory	Number of rural settlements, units			Number of rural settlements, depopulated and with a population of less than 10 people, units			Proportion of rural settlements, depopulated and with a population of less than 10 people in their total number, %		
	2002	2010	2010 to 2002 (+/-)	2002	2010	2010 to 2002 (+/-)	2002	2010	2010 to 2002 (+/-)
Vologda Oblast	8041	8006	-35	4671	5359	+688	58.1	66.9	+8.8
Arkhangelsk Oblast	3914	3970	56	1877	2277	+400	47.4	57.4	+10
Republic of Karelia	775	776	1	268	312	+44	34.6	40.2	+5.6
Republic of Komi	729	720	-9	103	134	+31	14.1	18.6	+4.5
Murmansk Oblast	135	112	-23	41	34	-7	30.4	30.4	0
Nenets Autonomous Okrug	43	41	-2	3	3	0	6.98	7.3	+0.32

Ranked in descending order of the number of rural settlements in 2010.
Compiled according to the data of the All-Russian population censuses for 2002 and 2010.

share of settlements without any population (in 2010 – from 26 to 50% of the total number of rural settlements; *Fig. 3*) is typical of rural areas of the near periphery: Vologodsky, Ust-Kubinsky, Gryazovetsky, Velikoustyugsky and other districts⁶. In our opinion, this is due to the impact of a strong centripetal vector of migration due to the proximity of large cities (Vologda, Cherepovets) and agglomerations.

It is worth noting that in the inter-census period of 1989–2010, the share of the population living in small rural settlements of the Oblast⁷ decreased from 37.7 to 32.2% (by 5.5 p.p.), in medium-sized ones – from 35.2 to 33.7% (by 1.5 p.p.). In turn, the share of the population living in large settlements increased from 9.7 to 17.0% (by 7.p.p.). Such a change in settlement patterns, when due to small and medium-sized settlements there is an increase

⁶ According to the typology of rural areas of the Vologda Oblast, presented in [29].

⁷ Classification of rural settlements: major – with a population of more than 3 thousand people, large – 1–3 thousand people, medium-sized – 200 people –1 thousand people, small – less than 200 people, in accordance with the Body of Rules 42.13330.2016 Urban Planning. Planning and development of urban and rural settlements. Updated version of SNIIP 2.07.01-89 (approved by the Order of the Ministry of Construction, Housing and Utilities of the Russian Federation no. 1034/pr, dated December 30, 2016).

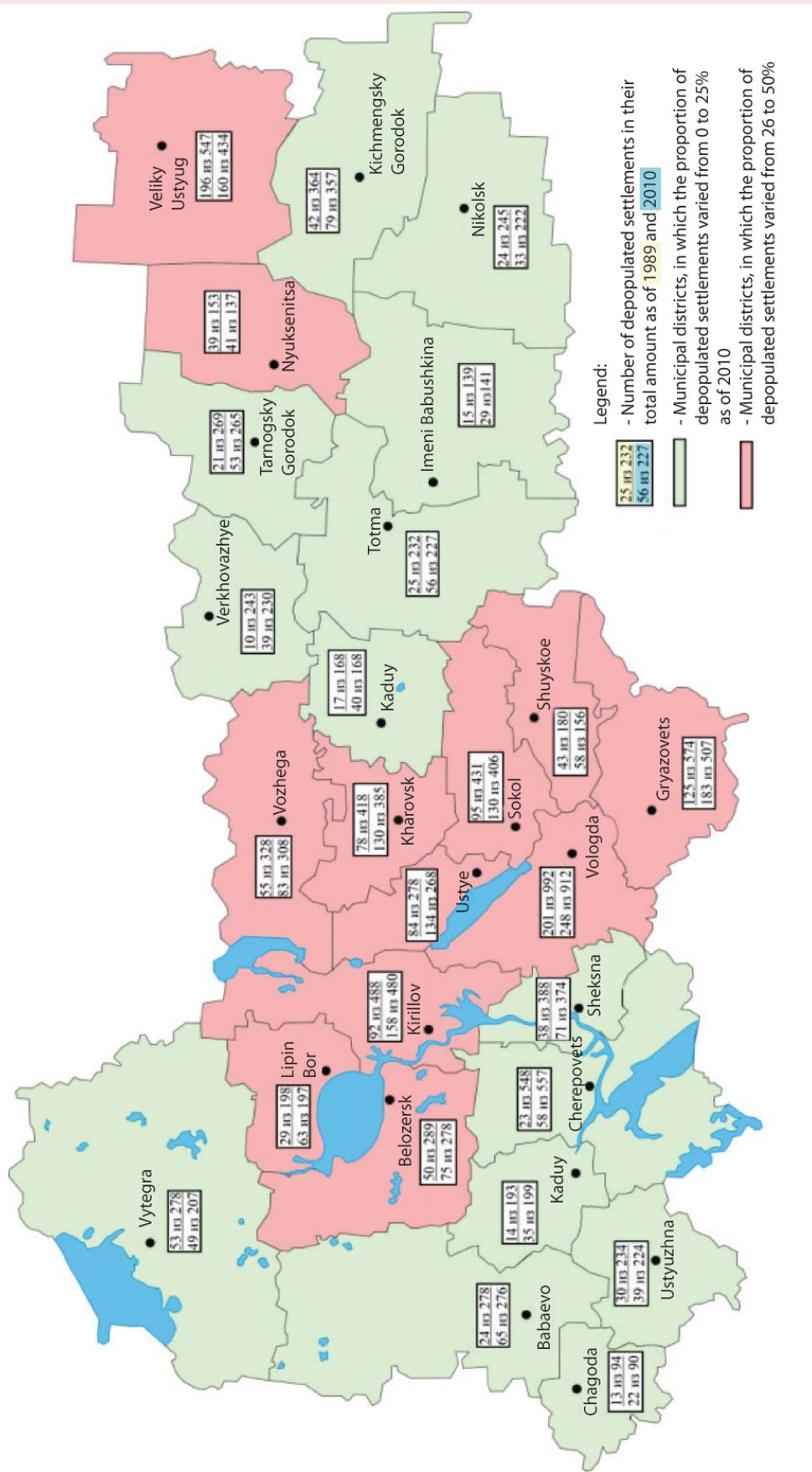
in the number of large settlements and depopulated settlements, is typical of Russia, and it will be preserved in the medium term⁸.

In general, the reasons for this transformation of the settlement framework are multifaceted, but they all stem from the lack of conditions and incentives for living and working in rural areas, especially in small villages.

Keeping residents from leaving the village was a difficult task back in the Soviet period; this task was addressed mainly by administrative methods. Doctor of Sciences (Sociology) V.I. Ilyin points out that “the introduction of the passport system and permissive registration in 1932 meant strict control of migration from the regions, especially for rural residents who had to request permission to obtain a passport from the administration of collective farms and state farms that were experiencing a permanent shortage of workers” [20]. Since 1974, when passports began to be issued to collective farmers freely, the pace of urbanization and, accordingly, desertification of the village has increased significantly. In turn, the collapse of the USSR

⁸ *On the State of Rural Areas in the Russian Federation in 2017: Annual Report According to the Monitoring Results*. Moscow: FGBNU “Rosinformagrotekh”, 2019. 332 p.

Figure 3. Proportion of depopulated rural settlements in municipal districts of the Vologda Oblast



and the market reforms of the 1990s contributed to the further strengthening of the position of cities as centers of political, social, and educational life, the formation of wider opportunities in cities for choosing work, self-education, leisure, etc. The often irrevocable migration of young people to cities caused an increase in the proportion of people of retirement and pre-retirement age among permanent residents of the northern village, this fact contributed to a decrease in total rural labor potential. Thus, as of January 1, 2020, there were 41.7% of rural women and 21.0% of rural men older than working age in the Vologda Oblast; for comparison, as of January 1, 2001, their proportions were 33.9 and 16.4%, respectively.

In general, the concentration of economic activity and conditions and resources for development in the city has contributed to the fact that a socio-economic and infrastructural gap between the city and the countryside has acquired new dimensions. However, in the regions within the ENR, the situation turned out to be much worse than the national average, and the

differences along the “village–city” line became particularly acute.

For example, if on average in Russia in 2019, 63,7% of the housing in the village was not equipped with all kinds of amenities, then this indicator in Karelia was 95.3%, in Komi – 94,1%, in the Vologda and Arkhangelsk oblasts – 86,3 and 93.4%, respectively (the only two exceptions were the Murmansk Oblast and Nenets Autonomous Okrug, where the number of rural settlements is much less than in other regions within the ENR; *Tab. 3*).

At the same time, in the post-reform period, among other things due to the optimization of education systems, healthcare, etc., the construction of socio-cultural facilities in rural areas virtually halted, and the facilities erected during the Soviet period were not repaired and were gradually closed. For example, the number of public libraries in the Vologda Oblast in 2005–2019 decreased by 34% (from 666 to 441 units), cultural and leisure type institutions – by 42% (from 741 to 433 units), and places in them – by 51% (from 106,227 to 52,075 units).

Table 3. Proportion of the area of the housing equipped with all types of amenities, in a total area of housing stock, %

Territory	Type of settlement	2015	2016	2017	2018	2019	2019 to 2015 (+/-), p.p.
Russian Federation	City and UTS	78.4	78.7	79.1	79.1	80.1	+1.7
	Village	30.8	31.5	32.6	34.2	36.3	+5.5
Republic of Karelia	City and UTS	67.1	66.6	66	67	67	-0.1
	Village	4.1	4.2	4.7	4.7	4.7	+0.6
Republic of Komi	City and UTS	70.5	71.3	71.6	72.2	76.5	+6
	Village	6.1	6.3	6.1	5.9	5.9	-0.2
Nenets Autonomous Okrug	City and UTS	69	69.3	68.9	76.8	76.6	+7.6
	Village	3	2.9	3.7	3.7	4	+1
Arkhangelsk Oblast	City and UTS	74.8	74.6	74.7	75.5	75.1	+0.3
	Village	6.6	6.6	6.4	6.6	6.6	0
Vologda Oblast	City and UTS	47.8	47.5	47.7	47.5	78.5	+30.7
	Village	12.8	13.2	13.3	13.4	13.7	+0.9
Murmansk Oblast	City and UTS	90.7	90.7	91.8	91.9	92.4	+1.7
	Village	80.1	82.9	82.1	79.8	78.9	-1.2

Note: UTS stands for “urban-type settlement”.
Compiled according to Rosstat data.

It is also worth noting that employment problems (for some localities, this actually means a lack of jobs and a high unemployment rate), combined with low wages, rather difficult working conditions in the main sectors of the rural economy – agriculture and forestry – in comparison with work in urban offices make the northern village less attractive for life and work⁹, especially for young people. So, if in 2019 the level of officially registered unemployment among rural population aged 15 and older averaged 6.2% in Russia, then in the regions within the ENR it ranged from 5.1% in the Murmansk Oblast to 11.3% in Nenets Autonomous Okrug (Tab. 4). On the other hand, the difference between the city and the village in the level of registered unemployment by 2019 in the regions of the ENR reached 2.26 times (Arkhangelsk Oblast).

But, as the researchers note [31], even employment does not guarantee a comfortable

existence in rural areas, because rural areas are dominated by the so-called economic poverty¹⁰, which manifests itself to the greatest extent in the agricultural sector. For example, in 2019, the average monthly wage for the type of activity “crop and animal husbandry, hunting and provision of relevant services in these areas” in the Vologda Oblast did not exceed 72% of the average for the Oblast economy, in the Arkhangelsk Oblast – 65%, in the Murmansk Oblast – 63%.

The main causes of unemployment and economic poverty, in our opinion, include destruction of the rural economy and, as a result, lack of jobs in the absence of opportunities for alternative (non-agricultural) employment. Like socio-demographic issues, economic problems of the northern village have significantly aggravated under the influence of space compression and increasing urbanization.

Table 4. Unemployment rate in the population aged 15 and older by type of settlement, %

Territory	Type of settlement	2010	2015	2016	2017	2018	2019	2019 to 2010 (+/-), p.p.
Russian Federation	City	6.4	4.8	4.8	4.3	4.0	3.9	-2.5
	Village	10.8	7.9	8.0	8.0	7.3	6.2	-4.6
Republic of Karelia	City	8.2	8.7	8.7	8.3	7.9	6.7	-1.5
	Village	14.8	9.3	11.4	10.1	12.6	10.8	-4
Republic of Komi	City	9.1	6.3	7.8	7.4	6.3	6.1	-3
	Village	14.6	9.8	12.2	9.7	11.5	9.7	-4.9
Nenets Autonomous Okrug	City	5.6	6.6	7.1	6.8	6.4	6.9	+1.3
	Village	9.0	11.3	12.8	11.8	13.3	11.1	+2.1
Arkhangelsk Oblast	City	-	6.1	5.6	5.1	4.8	5.0	-
	Village	10.7	9.4	13.1	11.2	12.9	11.3	+0.6
Vologda Oblast	City	6.5	6.2	5.7	4.6	3.7	4.2	-2.3
	Village	11.2	8.5	9.0	7.0	8.9	5.2	-6
Murmansk Oblast	City	8.9	7.7	7.6	6.9	6.6	5.5	-3.4
	Village	8.5	9.1	9.5	8.7	9.2	5.1	-3.4

Compiled according to Rosstat data.

⁹ According to the sociological survey “Human potential of rural territories”, the results of which are presented in [30], the main reason why rural residents of the Vologda Oblast change their place of residence is precisely the lack of work: 72.1% of residents under the age of 30 and 52.5% of residents aged 30 and older indicated this. The lack of educational institutions, medical care and leisure, and other difficulties were assessed by respondents as less significant.

¹⁰ In general, not only the vulnerable population groups (pensioners, people with disabilities, etc., as in social poverty), but also the economically active population (economic poverty) can end up below the poverty line.

The shift of agricultural production from north to south on a national scale since the 1990s has caused a reduction in acreage and livestock, destruction of agricultural infrastructure, etc. in constituent entities of the ENR [23; 32; 33]. The Arctic traditional economy including reindeer husbandry, fishing, hunting and animal husbandry turned out to be under threat due to an almost complete lack of cooperation regarding the processing of products and the absence of equipped facilities [2]. As a result, this led to a decrease in agricultural production (by more than 40% by 2019; *Tab. 5*), shut down of a number of

once large enterprises, reduction in the number of jobs and even destruction of the rural way of life.

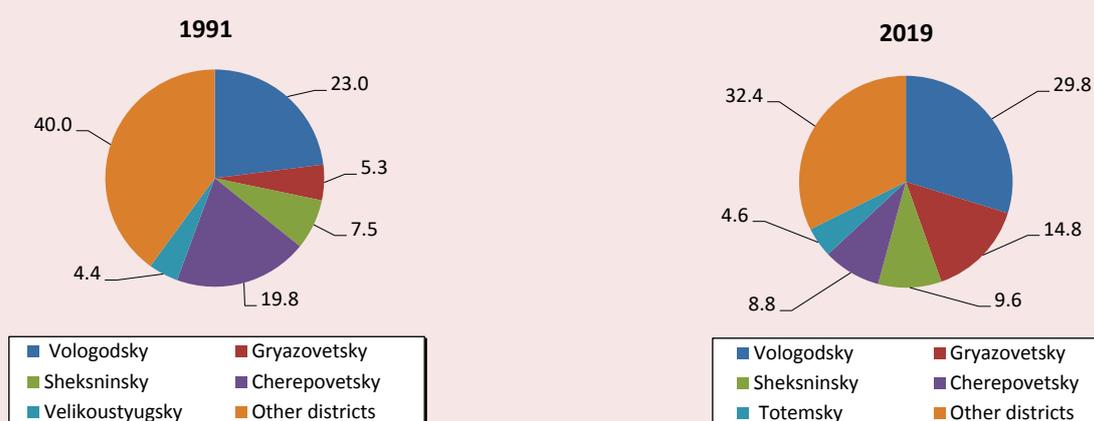
At the same time, spatial compression of agriculture within the regions of the ENR along the “core–periphery” line had a significant impact on the destruction of the rural economy. Using the Vologda Oblast as an example, we can trace that in 1991–2019 the share of municipal districts of the near periphery increased significantly (mainly due to the intensive factor) (the share of Vologodsky District increased by 6.8 p.p., Gryazovetsky – by 9.5 p.p., Sheksninsky – by 2.1 p.p.; *Fig. 4*).

Table 5. Index of the physical volume of agricultural production in constituent entities of the European North in all types of farms, % by 1990

Territory	1990	2000	2010	2019	2019 to 1990 (+/-), p.p.
Republic of Komi	100	65.1	54.6	56.7	-43.3
Vologda Oblast	100	74.7	51.0	52.8	-47.2
Republic of Karelia	100	48.8	38.9	25.2	-74.8
Arkhangelsk Oblast (with Nenets Autonomous Okrug)	100	56.6	32.6	24.5	-75.5
Murmansk Oblast	100	40.1	34.0	11.7	-88.3

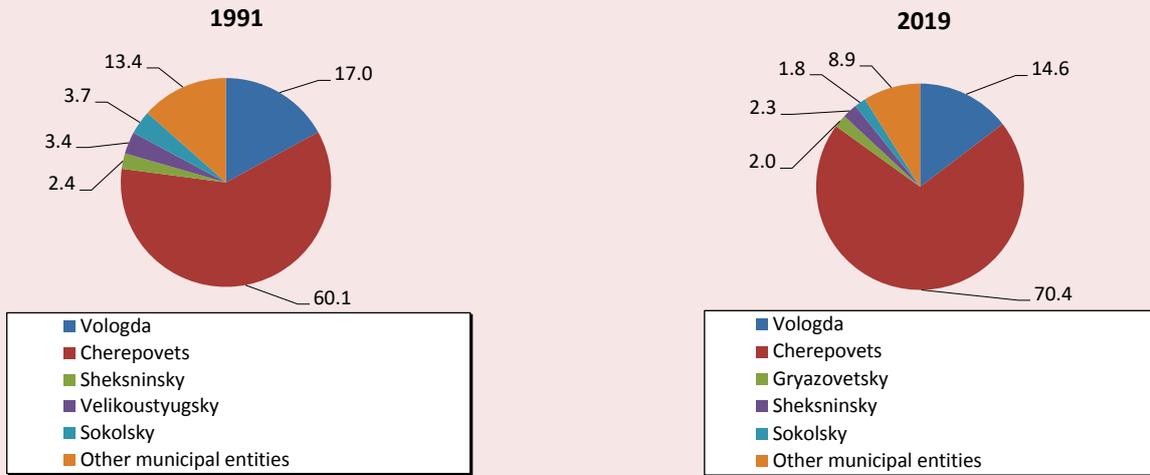
Ranked in descending order of the index of physical output in 2019.
Compiled according to EMISS data.

Figure 4. Distribution of municipal districts of the Vologda Oblast in the volume of agricultural production, %



Compiled according to the data of the Territorial Office of the Federal State Statistics Service for the Vologda Oblast.

Figure 5. Distribution of Vologda Oblast municipalities in the volume of industrial production, %



Compiled according to the data of the Territorial Office of the Federal State Statistics Service for the Vologda Oblast.

Similar trends can be traced in the field of industrial production. However, here the contraction was accompanied by the withdrawal of the manufacturing industry from rural areas¹¹. As a result, the share of all districts of the Oblast in industrial production for 1991–2019 decreased by 7.9 p.p. (from 22.9 to 15%; Fig. 5).

At the same time, the types of activities that are being abandoned in rural periphery areas were not sufficiently replaced by other, alternative ones, as evidenced by the studies [20; 23; 32]. This fact is also confirmed by the data of surveys of heads of municipalities of the Vologda Oblast conducted by VolRC RAS. Thus, according to the results of the 2020 survey, it was revealed that 51% of the heads of rural settlements believe that the level of diversification of the settlement economy is “poor” and “very poor” (Tab. 6; in urban settlements, only 28.6% of the heads indicated a similar level). According to its relevance for

¹¹ For example, during the Soviet period, the Vologda Optical and Mechanical Plant had six branches in the districts of the Oblast, thereby consolidating the territories and ensuring their involvement in the process of creating a public product; at present they are shut down.

the heads of rural settlements, the problem of insufficient diversification of the economy of territories is comparable to demographic issues.

Thus, by now, the northern rural periphery has become a secondary part of economic space, and its demographic, social, economic and infrastructural issues are significantly aggravated under the influence of space compression. In the sparsely populated rural areas of the North, the so-called social funnel has already formed: the decline in population is due to the destruction of the socio-economic potential of the territories (shut down of agricultural and industrial production, extremely low level of infrastructure facilities, etc.). This is a key factor in the further depopulation and economic desertification of the village, i.e. the compression of the previously developed part of the space.

However, we cannot say that state and regional authorities pay no attention to rural issues. Since the 2000s, specialized programs for socio-economic development of rural areas have been implemented in Russia, the Concept for sustainable development of rural territories of the Russian Federation for the period up to 2020 and the Strategy for sustainable development of the Russian Federation for the

Table 6. Assessment of the state of rural settlements by the end of 2019, % of respondents

Assessment parameter	Condition	
	good	poor and very poor
Demographic situation	5.3	68.4
Diversification of the economy	2.0	51.0
Employment	6.9	50.0
Economic development	3.7	46.3
Development of road transport infrastructure	0.0	44.6
Provision of the population with transport services	7.0	40.4
Provision of the population with communication services (Internet, cellular communication)	14.0	35.1
Accessibility and quality of healthcare services	12.1	25.9
Financial welfare of the population	5.3	22.8
Housing and utilities services	8.6	22.4
Provision of the population with housing	10.3	17.2
Ensuring public safety	14.3	10.7
Ecology	53.6	7.1
Accessibility and quality of education services	45.6	5.3
Recreation and culture	29.8	1.8
Note: 120–210 heads from 208–372 municipal entities of the region participate in surveys annually, which provides a sampling error of 4–5%.		
Compiled according to the results of the survey of heads of municipalities of the Vologda Oblast, 2020.		

period up to 2030 have been adopted. In addition, such “non-core” state programs for the village as “Development of physical culture and sports” and “Development of healthcare”, national projects “Culture”, “Education”, “Digital Economy”, etc. are aimed at addressing rural development issues.

Meanwhile, since 2019, the state program “Integrated development of rural territories” has become the main instrument of state regulation of rural development; due to its fullness, the program can be considered a practical step toward combining a sectoral and territorial approach to rural development in Russia and introducing an endogenous development model. The program is directly focused on creating conditions for comfortable living and the development of human resources in rural areas (but, unfortunately, employment promotion is provided only in agriculture).

At the level of RF constituent entities, the program-target management method is also actively used – rural development issues are

considered in regional programs for development of rural territories and agriculture, education and health systems, municipal infrastructure and road networks, and other programs. In addition, regional authorities are actively using other opportunities for development of rural areas:

1) the use of a project-based approach (it is possible to attract finances from grants issued by state and non-state funds, federal and regional authorities, as well as financial resources from business and the population for the implementation of socially significant rural projects; for example, within the framework of the state program “Integrated development of rural areas”);

2) participation in state programs and national projects of the Russian Federation and its constituent entities (subsidies for co-financing regional programs, for example, “Zemsky teacher” and “Zemsky doctor”, aimed at helping citizens find employment in rural areas; “People’s budget”, aimed at addressing socially significant issues, etc.);

3) holding town-planning councils, where initiatives of rural residents and local government bodies on rural improvement are discussed and supported (such a format of town councils has been introduced in the Vologda Oblast).

Addressing the issues of local importance in Russia is entrusted to local government bodies. But “this institution of power is not able to find solutions to the majority of rural problems” [23]. The main reason is the low endowment of municipalities with their own revenues. For example, all rural settlements of the Vologda Oblast are subsidized.

Despite a large number of tools for rural development, it is not yet possible to reverse the situation in the northern rural territories; attempts to bring the northern village out of the protracted crisis do not lead to the desired effect. In our opinion, the insufficient effectiveness of the state policy on rural development in Russia is due to the following reasons:

1. Flaws in the system of state management of territories development: it focused on the development of urbanized zones, concentration of productive forces in the capital, large cities and

agglomerations, and the absence of strategic positioning of the northern village in the national and regional space. We can prove this, for example, if we look into the Strategy for spatial development of the Russian Federation for the period up to 2025 approved by the Resolution of the Government of the Russian Federation no. 207-r, dated February 13, 2019. Thus, the ideas and political attitudes regarding rural development in the Strategy were actually ignored [2].

2. Incomparable size of state support for rural development in the regions.

For example, in 2020, the difference between the volume of subsidies for the integrated development of rural areas in regions reached 392 times between the Republic of Sakha (Yakutia) and Khanty-Mansi Autonomous Okrug (the difference per rural resident was 148 times; *Tab. 7*). At the same time, it should be noted that southern and central constituent entities of the Russian Federation as a whole made more efforts in preparing applications for participation in grants and activities under the program “Integrated development of rural areas” than northern entities¹².

Table 7. Distribution of subsidies to promote integrated rural development in 2020 in the context of RF regions

Territory	Provision of funds (according to the concluded agreements)					
	Total		including at the expense of funds from			
	mil. rubles	rubles per rural resident	federal budget		Budgets of RF constituent entities	
			%	mil. rubles	%	mil. rubles
Russian Federation	28 872.3	779.2	78.6	22 688.2	21.4	6 184.1
Republic of Sakha (Yakutia)	1 488.2	4508.4	92.3	1 373.6	7.7	114.6
Republic of Bashkortostan	1 610.1	1066.6	69.2	1 114.9	30.8	495.2
...
Amur Oblast	15.9	62.8	85.0	13.5	15.0	2.4
Sakhalin Oblast	7.7	89.8	43.0	3.3	57.0	4.4
Khanty-Mansi Autonomous Okrug	3.8	30.4	30.0	1.1	70.0	2.7

Ranked in descending order of the amounts of federal budget funds provided for 2020 within the framework of the state program “Integrated development of rural territories”.

Source: Ministry of Agriculture of the Russian Federation. Available at: <https://mcx.gov.ru/activity/state-support/funding/>

¹² According to the data posted on the website of the Ministry of Agriculture of the Russian Federation. Available at: <https://mcx.gov.ru/activity/state-support/urgent/>

3. Long-term preservation of an exogenous-and-sectoral approach in the implementation of rural policy in Russia [15; 34], as evidenced by the fact that according to official documents a key function of the village is production of food and raw materials for the development of the urban economy. This approach, in our opinion, initially puts northern rural territories in a vulnerable position in comparison with the territories of Chernozem region.

4. Low efficiency of the institute of local self-government, through which a subsidiary approach to management is implemented in Russia. The main reasons include the lack of financial support from the state with a shortage of own funds, lack of a wide range of administrative resources, dependence on regional authorities, and the lack of qualified personnel. At the same time, the forms of “direct implementation of local self-government by the population and its participation in the implementation of local self-government”¹³ in Russia have not become widespread, because they do not provide an opportunity to significantly influence the implemented policy aimed at rural development.

5. Insufficient development of cooperative and partnership relations both in rural areas and in the country as a whole; this fact contributes to the preservation of mutual barriers both at the national level and at the level of individual firms, hinders the expansion and strengthening of production and technological ties between the village and the city, etc. Despite the fact that Russia has a quite extensive network of production and consumer cooperatives, about 30% of them do not actually carry out their activities (in regions this value can reach 75% [35]). The main problems of cooperation development

in Russia include those related to the sale of cooperative products, flaws in the legal framework, lack of qualified personnel, under-capitalization of the cooperative base, weak desire for cooperation on the part of agricultural workers¹⁴, etc.

Thus, despite the availability of a large number of tools and potential opportunities for the development of rural areas in Russia, the condition of the northern village remains extremely vulnerable. Rural territories of the North, characterized by relatively unfavorable natural and climatic conditions and acute socio-economic issues, need special support from the state. According to one of the fundamental theoretical postulates of economics, the state of the economy and the social sphere reflects the quality of public administration [36].

Conclusion

Summing up the results of the study, we can conclude that rural areas of the North of Russia have many demographic, socio-economic and infrastructural problems. The northern village is perceived by most of society as a hopeless territory that is “cut off” from the rest of the country, and the potential of which is irretrievably lost. The reasons for the current situation are seen not only in the shock transition to a market economy in the 1990s and the strengthening of urbanization trends and spatial compression, but also in the insufficient effectiveness of governmental policy on rural development in the post-reform period.

In general, we see the prospects for development of Russia’s rural areas in the transition to a model of endogenous development with elements of neo-endogenous development, based on the effective use of internal drivers of development, competitive

¹³ According to Federal Law 131-FZ, dated October 6, 2003 (as amended on July 1, 2021) “On the general principles of the organization of local self-government in the Russian Federation”.

¹⁴ *Monitoring of the Implementation of the State Program (2008–2009)*. Moscow: Kolos, 2010. 424 p.; Yanbykh R.G. *Modern problems and prospects for the development of agricultural consumer cooperatives in Russia*. Available at: http://www.viapi.ru/publications/full/detail.php?IBLOCK_ID=45&SECTION_ID=1483&ELEMENT_ID=30737

advantages and mutually beneficial cooperation with urbanized territories. At the same time, in the context of the transition, additional focus on comprehensive development of the northern village and its integration into the national space should be formalized in strategic documents on Russia's territorial and spatial development, taking into account the interests of rural residents and the entire Russian society.

However, Russia's rural areas are heterogeneous and each has its own specifics; thus, it makes no sense to single out uniform ways to address rural issues in northern and southern regions, to talk about the general mechanisms of their development. In modern conditions, governmental policy in the field of rural development in the North of Russia, in our opinion, should have the following priorities:

1. Development of the rural economy in order to create conditions for increasing human potential of the village and raising the employment rate and income of rural residents.

Undoubtedly, a huge potential for economic development in the northern periphery of Russia can be found in the intensification and modernization of agriculture, forestry and fisheries, which is due to the available reserves of natural resources. Abandonment of these types of activities is impossible for the northern village and, in principle, groundless, just like in Russia's Chernozem region.

Meanwhile, economic development potential is directly related to economic diversification, which is not limited to rural, ecological and extreme tourism and folk crafts. However, one should understand that the development of new types of activities and the removal of industrial, social and other structures from cities will primarily be determined by the level of development of rural infrastructure and the preferences and advantages provided to business in the form of lower wages and rents, subsidies and tax benefits, etc.

2. Modernization of engineering and social infrastructure as a crucial factor in providing comfortable conditions for living, working, and doing business in rural areas. T.G. Nefedova points out that "the development of infrastructure must necessarily accompany and may even precede the development of the economy"¹⁵.

Despite the significant importance of social infrastructure, it is the infrastructure of transport, information and communication that connects the space of villages and cities into a single whole, creates an opportunity for the movement of goods, people, and economic resources. If this infrastructure is absent or its condition is unsatisfactory, the countryside becomes isolated from the rest of the space.

In our opinion, if just these two priorities are implemented, this can lead to the establishment of conditions for development of rural areas and even reduce the pace of space compression; thus, the two major issues of the northern village – disintegration of the economy and infrastructure – will be resolved.

3. Comprehensive development of human capital in rural areas as the main goal of all economic and social transformations.

In the near future, it will be futile to expect that the trend of migration outflow will be replaced by an influx of population to the northern village. A further reduction in the number of rural settlements is also inevitable. But, despite this, the remaining population still needs affordable medical care and guaranteed social services, favorable conditions for improving the level of culture, leisure activities, opportunities for implementation of labor potential, development of civil society, and provision with safe living conditions in general.

¹⁵ A rural Russia: Spatial shrinkage and social polarization. *Polit.ru*. Available at: <https://polit.ru/article/2010/08/05/countryside/> (accessed: July 15, 2021).

In part, these tasks can be implemented through the use of the potential of small towns and medium-sized cities, which are the nearest centers for providing state and municipal services to people, and social services to rural areas.

Thus, we see the future for the northern village in overcoming existing social, economic, and infrastructural isolation.

The significance of the study lies in the fact that it identifies the problems of rural development in

the context of compression of the northern region along the “village–city” line and substantiates priority directions for rural periphery development. The results obtained can be used by researchers in conducting studies on similar topics, by federal and regional authorities, local government bodies in developing strategic documents for spatial development of territories and improving the mechanisms of socio-economic development of rural periphery in the North.

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Modeling the Impact of Bank Investments Attracted by Institutional Sectors on the Socio-Economic Development of Russian Regions*



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Abstract. Banking capital plays a significant role in providing the financial foundations for the development of institutional sectors in regional systems, which include financial and non-financial corporations, households, public administration sector and foreign institutions. However, a study of the processes of banking capital flows between them shows that the banking sector currently does not perform its traditional functions of saving institutional sectors' capital and providing them with loans, but carries out a speculative policy, contributing to a significant outflow of financial resources abroad and causing serious harm to the Russian economy. In this regard, the purpose of the work is to study the imbalances in the processes of banking capital flows between institutional sectors and to model the impact of bank

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investments attracted by institutional sectors on the socio-economic development of constituent entities of the Russian Federation. We have developed a methodological approach based on the methodology of forming balanced matrices of financial flows between institutional sectors using data from the primary accounting statements of loan institutions, the methodological principle of double entry bookkeeping of the System of National Accounts and methods of regression analysis using panel data. We built matrices of financial flows in the regions, characterizing the processes of bank capital flows between the sector of financial and non-financial corporations, public administration, households and foreign institutions, regression models characterizing the impact of bank investments attracted by each institutional sector on the indicators of socio-economic development of regional systems. The study has found that the capital raised by banks in the sector of non-financial corporations has a positive impact on the dynamics of the gross regional product of Russia's constituent entities, leads to a decrease in unemployment in the regions, the number of people with incomes below the subsistence level, the degree of capital consumption, as well as an increase in the balanced financial performance of enterprises and the average monthly nominal wage.

Key words: bank investments, financial flows, institutional sector, regression analysis, panel data.

Introduction

The banking sector plays a key role in the economic development of regional systems of various levels. It provides the real sector of the economy with financial resources to implement investment projects aimed at modernization and technological renewal of production processes, introduction of technical-technological, organizational and social innovations, to diversify production and increase competitiveness of manufactured products. Studies carried out by A. Aganbegyan, I. Rudenskii [1], A. Milyukov [2], P.V. Akinin, V.P. Akinina [3], E.A. Goncharuk¹, V.V. Trubnikova, A.V. Savenkova [4], A. Danilov-Danil'yan [5], N.P. Kazarenkova [6], V.A. Ilyin et al. [7], M.A. Pechenskaya [8], B. Urosevic, B. Zivkovic, M. Bozovic [9], S. Gilchrist, E. Zakrajsek [10] showed the importance of attracting bank investments in the real economy, leading to

enterprises of various types of economic activity. Along with providing the non-financial corporate sector with credit resources, banks and loan institutions perform another important function: they provide settlement and cash services to enterprises and ensure the safety of their financial resources.

The banking sector forms the financial foundation for the implementation of infrastructure projects, strategic programs and projects of regional systems through investments in debt securities (government agencies, Russian Federation constituent entities, municipalities) and lending their public debt. Studies by D. Monacelli, M.G. Paziienza, C. Rapallini [11], W. Jeong [12], I.V. Naumov [13] testify that the capital attracted by banks contributes to an increase in the budgetary security of territories, and its use helps address acute socio-economic problems of their development.

Providing households with consumer and mortgage loans, carrying out activities for the preservation of money savings, the banking sector forms the financial foundation for the development

¹ Goncharuk E.A. Attraction of financial resources by the corporate sector of the economy in the capital market: Candidate of Sciences (Economics) dissertation. Saint Petersburg, 2018. 206 p. Available at: https://unecon.ru/sites/default/files/dissertaciya_goncharuk_e.a._03.06_0.pdf (accessed: July 5, 2021).

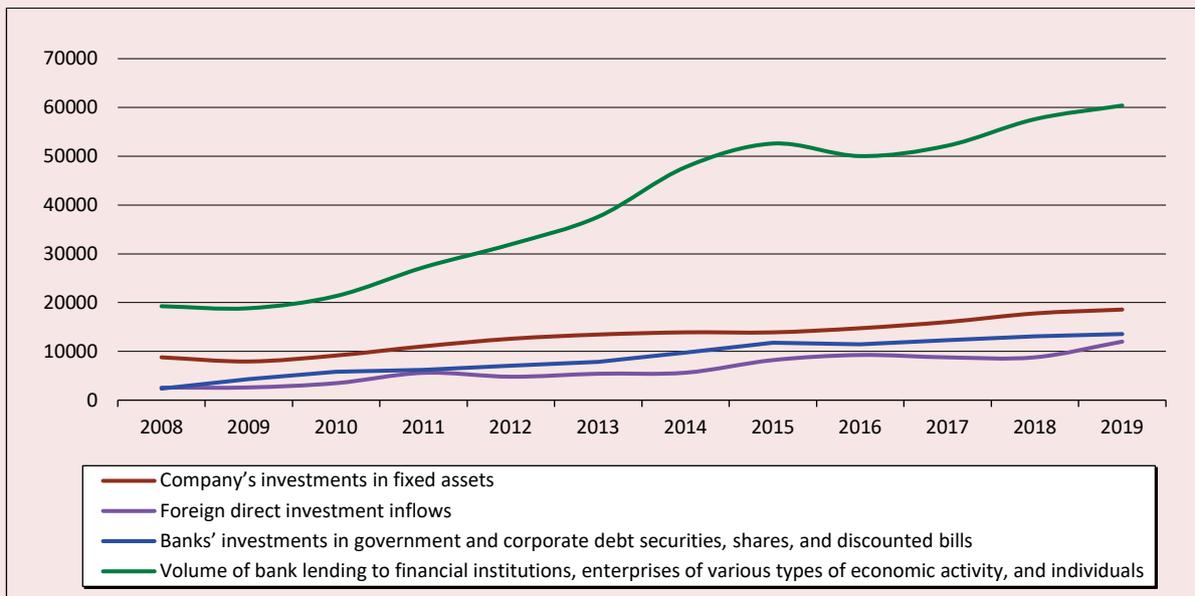
of this institutional sector of the economy. Studies conducted by E.I. Strogonova [14], L.M. Yusupova, T.V. Nikonova, M.E. Ivanov [15], L.F. Orlov [16], K. Ellis, A. Lemma, J.-P. Rud [17], S. Bouyon [18], O.G.F. Mwalughali [19], confirm the importance of attracted banking resources for the development of the household sector. By investing in equity and debt securities of other financial institutions, providing credit resources to insurance organizations, investment companies, pension funds, the banking sector contributes to the development of the financial corporation sector in regional systems, which performs important functions for households and the real sector of the economy.

Thus, we can note that the banking sector is a link in the development of the institutional sectors of the economy, which, according to the methodology of the System of National Accounts, include sectors of financial, non-financial corporations, public administration, households and foreign

institutions. The dynamics of changes in the volume of investments attracted by banks in government and corporate debt securities, shares, as well as the volume of lending to various institutional sectors shows that the banking sector has a truly powerful investment potential for progressive socio-economic development of regions (*Fig. 1*).

Based on the data presented in Figure 1, we can conclude that the investment opportunities of the banking sector exceed many times the investment resources of enterprises of various types of economic activity, as well as direct foreign investments coming into the economy. However, as our earlier studies have shown [20], in the periods of increasing crisis phenomena in the economy the banking capital is not used to solve the financial problems of the development of the real sector of the economy and the public administration sector, it is increasingly used for speculative purposes. Loan institutions carry out speculative operations

Figure 1. Dynamics of changes in the volume of investment resources of enterprises, banking institutions, foreign institutions in Russia for the period 2008-2019, bil. rub.



Source: own compilation according to the Regional Section of the Central Bank of the Russian Federation and the Federal State Statistics Service.

with foreign currency, derivatives (futures and options), invest in equity and debt securities of foreign issuers, place funds on settlement accounts of foreign financial institutions, contributing to the outflow of a large part of capital abroad and reducing the volume of lending to financial, non-financial corporations, the household sector and public administration. The banking sector in times of economic and financial crises ceases to perform its traditional functions of accumulation, saving and reproduction of financial resources of institutional sectors of the economy. Speculative operations carried out by it lead to growing imbalances in the distribution of financial resources between institutional sectors, negatively affect the financial sustainability of institutional sectors, reduce their investment opportunities to solve the most important problems of socio-economic development. That is why the main purpose of the work is to study the imbalances in the processes of banking capital flows between institutional sectors and to model the impact of banking investments attracted by institutional sectors on the socio-economic development of the Russian Federation constituent entities.

Review of research on assessing the impact of bank investments attracted by the institutional sectors on the socio-economic development of territories

Theoretical review of the works shows that to assess the impact of bank investments on the dynamics of socio-economic development of regional systems, researchers usually use statistical methods of data analysis (relative indicators, averages and dynamics indicators) and regression modeling methods. The simplest statistical methods for studying the role of bank capital in the socio-economic development of territories were applied by N.P. Kazarenkova [6], L.N. Sotnikova, M.V. Tkacheva [21], V.I. Terekhin, O.P. Sukovatova [22],

T. Beck, R. Döttling, T. Lambert, M. van Dijk², P.V. Akinin, V.P. Akinina [3] and others. These methods allowed researchers to estimate only superficially the impact of investments attracted by banks on the socio-economic development of enterprises of the real sector of the economy, households and the public administration sector, to form initial assumptions about this impact. Regression analysis methods were most often used to justify the assumptions. For example, in order to assess the short- and long-term effects of public investment on economic growth and private investment, C.T. Nguyen, L.T. Trinh projected autoregressive distributed lags models, given the macroeconomic data of Vietnam for the period 1990–2016. [23]. T.I. Solodkaya, M.M.T. Tali, and M.A. Industriev established cointegration of non-stationary time series: gross domestic product, total capitalization volume of the Moscow Exchange, and bank lending to individuals and legal entities. The Engle Granger test found a cointegrating relationship confirming the long-term equilibrium relationship of the variables and the genuineness of their correlation. It showed that economic growth depends more on the volume of bank lending and less on the growth of market capitalization of stocks [24]. T.V. Pogodaeva, N.A. Baburina, E.P. Druz', M.P. Sheremet'eva used methods of economic-statistical and econometric analysis to identify the impact of banking sector development indicators on the socio-economic development of states [25]. P.V. Porubova identified a differential economic and mathematical model of multiplication and acceleration according to the economic development of Russia and the Republic of Kazakhstan, reflecting the

² Beck T., Döttling R., Lambert T., Dijk M. van. How banks affect investment and growth: New evidence. 02 July 2020. Available at: <https://voxeu.org/article/how-banks-affect-investment-and-growth> (accessed: June 15, 2021).

dependence of GDP growth rates on such factors as the volume of investment and the value of the investment multiplier. This model allowed P.V. Porubova to determine the values of factors necessary to accelerate the dynamics of economic development³.

Md.S. Alam, M.R. Rabbani, M.R. Tausif, J. Abey formed a dynamic vector error correction model (VECM) based on panel data of 20 public sector banks from 2009 to 2019, and a fully modified least squares panel OLS (FMOLS) and dynamic OLS (DOLS) to estimate the relationship between return on interest margin on assets and bank investment and credit capacity with GDP [26]. Using quarterly GDP data, as well as various commercial bank indicators covering the period from March 2005 to December 2016, E. Paavo examined the impact of commercial bank dynamics on economic growth in Namibia. The study used the autoregressive distributed lag (ARDL) approach to determine the presence of short-term and long-term relationships, as well as the Engle Granger test to determine the cause and effect relationship between the development of the banking sector and economic growth [27]. M. Prochniak, K. Wasiak analyzed the impact of the financial sector on the economic growth of 28 EU countries and 34 OECD countries in the period 1993–2013 by applying extended econometric modeling, including testing of nonlinear relationships. Regression equations were estimated using Blundell and Bond's GMM estimation system [28].

At the regional level, regression analysis was used, for example, by P.A. Ivanov and T.I. Tyutyunikova, who justified the impact of bank lending to households on the gross regional product by the

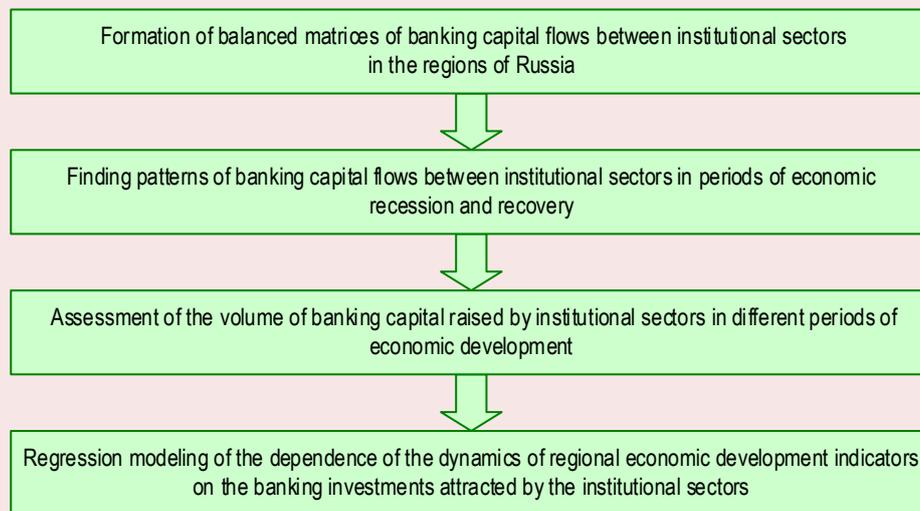
example of the Republic of Bashkortostan [29]. A review of the current state of scientific works in this area shows that regression analysis is the most frequently used method for assessing the impact of bank investments on the socio-economic development of territories. This very set of tools that will be the basis of the methodological approach in our study.

Methodological approach to assessing the impact of bank investments attracted by the institutional sectors on the socio-economic development of Russian regions

Theoretical review of the works shows that the main obstacle to the study of the role of banking capital in the socio-economic development of Russian regions is a fragmented and underdeveloped statistical database formed by the state statistics authorities, the Central Bank and the Ministry of Finance of the Russian Federation. Official statistics provide information on regional specifics of banks' lending to individuals and legal entities, public debt of the RF constituent entities, banks' investments in debt and equity securities of enterprises in various spheres of economic activity, debt securities of the RF constituent entities and municipalities. At the same time, official statistics do not allow assessing the impact of investment by banks and other loan institutions in monetary gold, foreign currency and financial derivatives on the socio-economic development of regional systems. In order to solve this problem and to analyze in a more systematic way the capital attracted by banks to the economy, we developed a methodological approach (*Fig. 2*) based on the methodology of forming balanced models of financial resources flow between institutional sectors within the regional system, which, in accordance with the System of National Accounts, include the financial corporations sector (the Central Bank, banks and other loan institutions, investment companies),

³ Porubova P.V. Development of differential models of long-term macroeconomic growth (on the example of Russia and Kazakhstan): Candidate of Sciences (Economics) dissertation. Samara, 2019. 154 p. Available at: https://ssau.ru/files/resources/dis_protection/Porubova_P_V_Razrabotka_differencialnih_modeley.pdf (accessed: June 15, 2021).

Figure 2. Methodological approach to assessing the impact of bank investments on socio-economic development of regions



Source: own compilation.

non-financial corporations sector (enterprises of various types of economic activity), the public administration sector (state-owned enterprises and budgetary institutions), the households sector and foreign institutions.

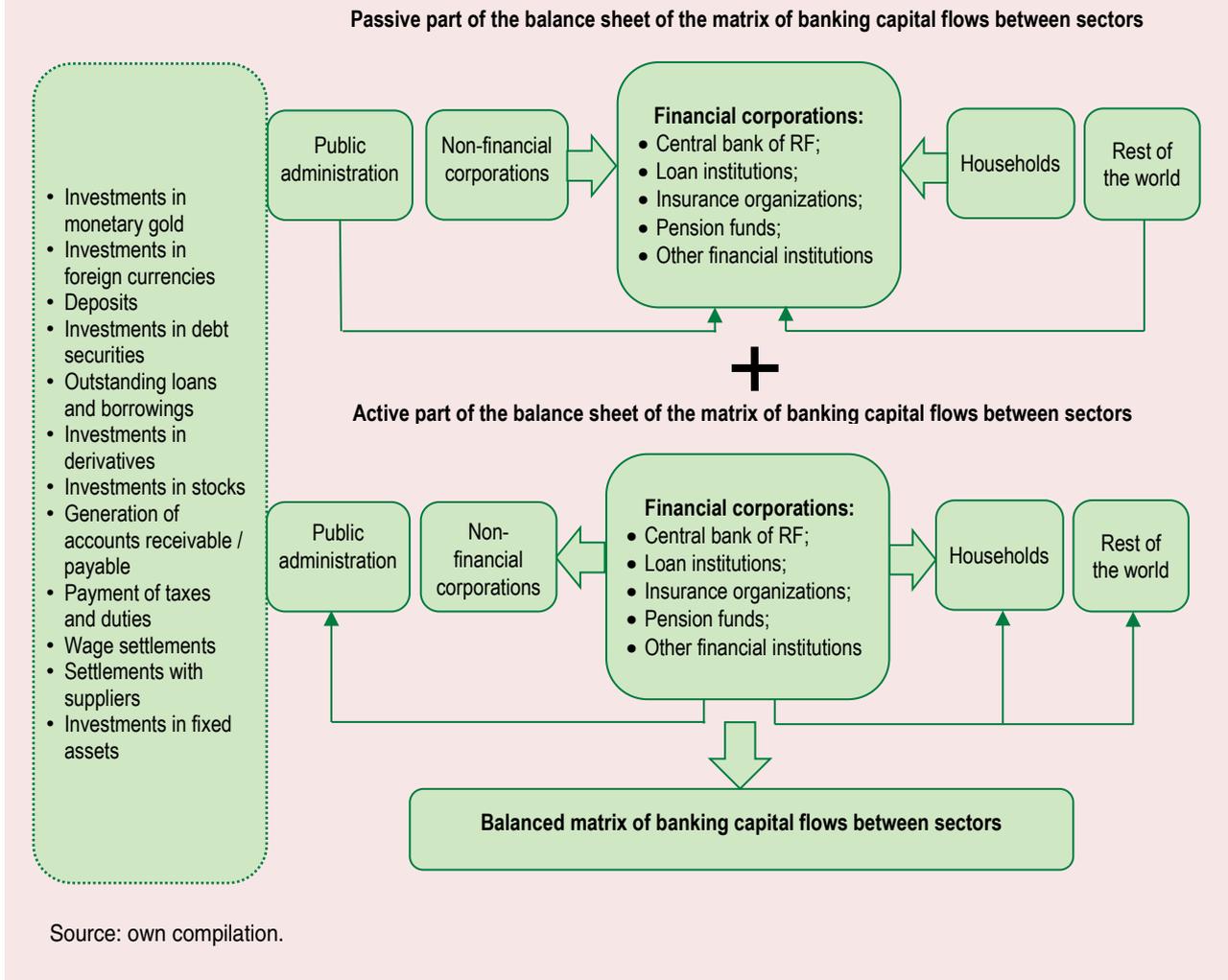
The initial stage of the study, according to the presented approach, is the formation of balanced matrices of bank investment flows between financial and non-financial corporations, the household sector, public administration and foreign institutions. For the most complete and accurate reflection of the processes of bank capital flow we propose to use the primary data of the turnover statement on the accounting records (form no. 101) of banks and other loan institutions registered in the territory of the region under consideration. This reporting form contains detailed information about the banks' financial resources flows not only on traditional investment instruments, which are reflected in the official statistics (lending to individuals and legal entities, public debt of the Russian Federation constituent entities, operations with deposits, debt

and equity securities of various institutional sectors), but also on such instruments as investments in monetary gold, foreign currency, derivatives.

For the formation of balanced matrices of financial flows between sectors we applied the basic principles of the formation methodology of the System of National Accounts: the double-entry bookkeeping, the list of institutional sectors of the national economy and the structure of their financial account (*Fig. 3*).

The principle of double-entry bookkeeping used in the matrices of the bank financial resources flows between sectors allows studying the specifics of potential formation by some sectors and use by other sectors. In the matrices, investments in various financial instruments are shown with a negative sign for the sector that carries them out and with a positive sign for the sector that receives funds as a result of asset sales. Lending transactions to institutional sectors by banking institutions, according to this approach, are shown on the asset side of the balance sheet with a negative sign for

Figure 3. Algorithm of forming a balanced matrix of banking capital flows between institutional sectors in the region



the loan institution sector and a plus sign for the borrowing sector. The reverse situation arising from the repayment of taken loans is shown in this matrix with opposite signs. As a result, the model balances the financial flows between institutional sectors. Formed accordingly, the passive part of the balance sheet of the financial flows matrix reflects the processes of formation of the banking sector investment potential of the economy and its use by other institutional sectors, the active part, by contrast, reveals the features of attracting banking capital by sectors of financial and non-financial corporations, public administration, households and

foreign institutions. The negative sign for the sectors in the balanced matrix allows concluding that the volume of investments they attract is reducing and their investment opportunities become less favorable. The negative balance sign also reflects the amount of funds invested by institutional sectors, which helps determine the financial instruments for using the investment potential of institutional sectors. The positive final value of the balance in the balanced matrix allows assessing the investment opportunities for the development of institutional sectors, and the volume of bank investment they have attracted.

The formed matrices of the banking capital flows for all regions of Russia in dynamics for the period from 1998 to 2019 will make it possible in the second stage to establish patterns of banking capital flows between institutional sectors during periods of economic recession and recovery and in the third stage – to estimate the amount of attracted banking capital by institutional sectors in different periods of economic development. The comparison of the identified patterns in the processes of attracting banking capital by institutional sectors and indicators of socio-economic development of regions using regression modeling on panel data, carried out at the final stage of the study, will allow us to make objective assessment concerning the role of the banking sector in the development of the economy. In the course of modeling it is planned to study the impact of the dynamics of bank investments attracted by the public sector of the economy on the dynamics of gross regional product, consumer price index, unemployment rate, the number of population with incomes below the subsistence level, the amount of average per capita cash income and income of consolidated budgets of the RF constituent entities.

In order to assess the impact of banking resources attracted by the household sector, we propose to form regression models in which the dependent variables are unemployment rate, average monthly nominal accrued wages per employee, the proportion of the population with incomes below the subsistence level. The formation of these models will allow assessing the impact of bank resources attracted by households on the indicators of their financial security. In addition, the study assumes the construction and regression models of the impact of the dynamics of banking capital attracted by the non-financial corporations on the dynamics of GRP, industrial production index, the degree

of depreciation of fixed production assets, exports of manufactured products, balancing of financial performance of organizations, the amount of their overdue accounts payable, unemployment rate, the share of the population with incomes below the subsistence level, the average monthly nominal wage per employee.

During the construction of regression models, the analysis of data for stationarity using the Dickey-Fuller test, the formation of regressions with fixed and random effects and the selection of the most adequate models using the Hausman and Breusch-Pagan tests, as well as the Schwartz, Akaike and Hannan-Quinn information criteria, the analysis of statistical significance of regression parameters and the implementation of the basic assumptions of Gauss-Markov. The models built allow justifying or disproving the impact of attracted by the institutional sectors bank investments on the dynamics of socio-economic development in the regions of Russia.

The patterns of banking capital flows between institutional sectors in the regions of Russia

The systematization of data from the accounting turnover balance sheet according to Form no. 101 of regional banks for the period from 1999 to 2019 allowed forming matrices of banking capital flows between institutional sectors in each region according to different investment instruments. An example of such a matrix, characterizing the processes of banking capital flows between sectors in Russia as a whole, is presented in *Table 1*. The data show that bank capital in 2018 was actively raised by the Central Bank of Russia (6,008 bil. rub.), the non-financial corporation sector (1,913 bil. rub.), and households (712 bil. rub.). A significant part of the banking capital was raised by the sector of foreign institutions (3,784 bil. rub.) in the form of lending (1,075 bil. rub.) and investment in foreign currency (4,722 bil. rub.).

Table 1. Balanced matrix of banking capital flows between institutional sectors in Russia in 2018, bil. rub.

Investments	Financial corporations			Public administration	Non-financial corporations	Households	Rest of the world
	CBR	Banks	Other institutions				
1. Investments in gold	28	131	-29	6	6	-49	-93
2. Cash currency	4,664	-5,260	-4,700	13	9	552	4,722
3. Deposits	1,150	7,153	-651	-2,589	-1,974	-2,783	-306
time deposits (up to 30 days)	144	594	-223	129	-337	-277	-31
short-term deposits (from 30 days to 1 year)	462	3,368	-268	-1,580	-996	-1,068	82
medium-term deposits (from 1 to 3 years)	0	116	96	-396	130	88	-34
long-term deposits (over 3 years)	0	466	27	-65	-644	-214	430
demand deposit	542	2,445	-119	-677	-128	-1,312	-752
4. Investments in debt securities	453	3,079	-853	-962	-771	273	-1,218
available for sale	779	-509	-43	27	-4	-3	-246
maturity up to 1 year	1	-241	36	0	1	204	0
maturity from 1 to 3 years	-5	-76	40	0	-5	46	0
on demand	-322	3,905	-886	-989	-763	26	-972
5. Loans provided	-231	-6,256	-606	-75	2,758	3,335	1,075
short-term loans (up to 1 year)	607	-634	42	-38	373	-9	-340
medium-term loans (from 1 to 3 years)	495	-1,067	-28	52	223	126	199
long-term loans (up to 3 years)	-1,332	-4,591	-413	-87	2,133	3,032	1,259
on demand	0	35	-206	-2	30	186	-43
6. Investments in derivatives	0	-377	377	0	0	0	0
7. Investments in stocks	-49	4,321	-1,866	-555	-879	-511	-461
8. Overdraft	-8	-18	-79	1	89	-64	79
9. Tax payments	0	-63	0	63	0	0	0
10. Wage payment settlement	0	14	0	-3	0	-11	0
11. Settlements with suppliers	0	-2,607	-1	0	2,624	0	-15
12. Investments in fixed assets	0	-117	1	93	53	-30	0
BALANCE	6,008	0	-8,408	-4,009	1,913	712	3,784

Source: own compilation on the basis of the turnover statement no. 101 of loan institutions.

By forming matrices for each region for the period from 1999 to 2019, the following patterns have been established. During the periods of economic recession (1998–1999, 2003–2004, 2008–2009, 2014–2015, 2018) there was a significant outflow of banking capital abroad, caused by the speculative investment policy implemented by banks with foreign currency, equity and debt securities of foreign issuers.

The volume of lending to the real sector, the public administration sector and households sharply declined during these periods, while

lending to foreign institutions increased. Instead of active financial support of the real economy during recessions and crises, banks actively transferred their capital abroad (*Tab. 2*).

During the periods of worsening economic situation, the volume of bank investments attracted by the sector of non-financial corporations, which includes enterprises of various types of economic activity, also declined. The capital accumulated by banks was used for speculative purposes, namely for investments in high-risk derivatives (futures and options).

Table 2. Dynamics of banking capital flows between institutional sectors in Russia over the period 1998-2019, bil. rub.

Year	Financial corporations		Public administration	Non-financial corporations	Households	Rest of the world
	CBR	Banks				
1998	20	-32	-25	45	-20	12
1999	-7	11	7	4	-1	-14
2000	40	-41	-1	-2	-13	18
2001	14	-32	-29	64	-16	-2
2002	122	-271	276	882	-941	-69
2003	174	-49	8	137	-178	-91
2004	-149	123	-229	478	-120	-102
2005	-296	216	-129	612	-202	-201
2006	-182	74	-466	1,080	-50	-456
2007	-400	-77	-799	1,883	-138	-470
2008	-1,768	-1,816	-3,051	7,868	-772	-461
2009	951	-1,714	-1,191	2,281	-2,757	2,429
2010	1,557	925	492	-1,567	-1,182	-225
2011	-1,875	706	-1,618	2,791	-703	700
2012	-1,460	-932	-827	2,629	315	275
2013	-3,193	1,893	-1,459	3,580	-397	-424
2014	-4,050	2,182	-4,084	4,832	-1,870	2,991
2015	-2,861	-4,437	-4,735	4,044	-4,596	12,586
2016	179	5,476	1,667	-1,555	-1,317	-4,449
2017	-3,847	10,940	1,060	-1,819	-1,235	-5,099
2018	6,008	-8,408	-4,009	1,913	712	3,784
2019	4,637	-1,096	-2,092	799	454	-2,701

Source: own compilations on the basis of the turnover statement no. 101 of loan institutions.

During the periods of economic recovery (2000–2002, 2005–2007, 2010–2013, 2016–2017), there were opposite patterns in the processes of bank investment flows between sectors. Banking capital returned from abroad and was actively used for lending to non-financial corporations, the public administration sector and households, for investments in equity and debt securities of the real sector of the economy and constituent entities of the Russian Federation and federal loan bonds. During the periods of economic

recovery, banking capital was actively attracted by institutional sectors, the interest of banks in high-risk derivatives decreased (see Tab. 2). The formation of the balancing matrix of the banking investment flows between sectors with the increase since 1998 allowed establishing that at present (as of January 1, 2020) a significant share of financial resources accumulated by banks of institutional sectors still remains abroad. This poses threats to the financial development of Russian regions.

Results of regression modeling of the dependence of regional economic development on bank investments

As a result of the study, using 1,716 observations, the dependence of the dynamics of gross regional product of the Russian Federation constituent entities on bank investments attracted to the sector of non-financial corporations was established:

$$Y = 452123 + 0.289 \cdot X, \quad (1)$$

where Y – the volume of GRP of the Russian Federation constituent entities, in current prices, mil. rub.;

X – the volume of bank investments attracted in the sector of non-financial corporations, mil. rub.

According to the results of the Hausman and Breusch-Pagan tests, as well as the comparison of Schwartz, Akaike and Hannan-Quinn information criteria, we found that the optimal model of the relationship of these indicators is a regression model with fixed effects. Its reliability is confirmed by low values of standard errors and *p*-values in regression parameters, high value of coefficient of determination and its statistical significance (*Tab. 3*).

The model showed that the inflow of additional bank investments in the sector of non-financial corporations in the amount of 1 mil. rub. contributes to the growth of GRP by 0.289 mil. rub.

A generalized least squares regression model shows that the inflow of bank investment in the sector of non-financial corporations contributes to the reduction of unemployment in the regions:

$$Y = 8.685 - 0.000000134 \cdot X, \quad (2)$$

where Y – the unemployment rate of the Russian Federation constituent entities, %;

X – the amount of bank investments attracted to the sector of non-financial corporations, mil. rub.

The banking resources attracted to the sector of non-financial corporations in the form of lending and investment in equity and debt securities form the financial basis for enterprises to carry out modernization and technological renewal, increase production capacity and diversify production, which helps create new jobs and reduce the unemployment rate in the regions. The parameters of the regression model presented in *Table 4* confirm its reliability.

Table 3. Model of the impact of bank investments attracted by the non-financial corporations sector on the dynamics of GRP of the constituent entities of the Russian Federation

	Coefficient	Standard error	<i>t</i> -statistics	<i>P</i> -value
<i>const</i>	452,123	19 674.8	22.98	1.64e-101***
<i>X</i>	0.289	0.07	4.118	4.02e-05***
<i>R-squared</i> = 0.608	<i>F</i> (78, 1637) = 32.53		<i>P</i> -value (<i>F</i>)	2.5e-275***
Schwartz criterion	52 082.99		Akaike criterion	51 652.62
			Hannan-Quinn criterion	-25 747.31
Distribution free Wald test for heteroskedasticity			Chi-square (78) = 1.79e+008	0.000***
Wooldridge test for autocorrelation			Test statistics: <i>T</i> (1.77) = 338.679	6.43e-030***
The null hypothesis – the absence of a normal distribution			Chi-square (2) = 9097.65	0.000***
Pesaran CD test for cross-sectional dependence Average absolute correlation = 0.981			Test statistics: <i>z</i> = 252.24	0.000***
Source: own compilation. *** Statistical significance at the level of 1%.				

Table 4: Model of the impact of bank investments attracted by the sector of non-financial corporations on the unemployment rate in the RF constituent entities

	Coefficient	Standard error	t-statistics	P-value
<i>const</i>	8.685	8.685	59.8	0.000 ***
<i>X</i>	-1.34574e-06	4.73203e-07	-2.844	0.0045 ***
<i>R-squared</i> = 0,0047	F (1.1714) = 8.0876		<i>P-value</i> (F)	0.00451
Schwartz criterion	11035.66		Akaike criterion	11024,77
			Hannan-Quinn criterion	11028.80
The White test for heteroscedasticity			Test statistics: <i>LM</i> = 0.76353	0.068*
Wooldridge test for autocorrelation			Test statistics: <i>T</i> (77) = 34.992	4.951e-049 ***
The null hypothesis – the absence of a normal distribution			Chi-square (2) = 3844.43	0.000 ***
Pesaran CD test for cross-sectional dependence Average absolute correlation = 0.743			Test statistics: <i>z</i> = 179.97	0.000 ***
Source: own compilations. ***, * Statistical significance at the level of 1 and 10%, respectively.				

The study found a correlation between the proportion of the population with incomes below the subsistence level and the inflow of bank investments into the sector of non-financial corporations:

$$Y = 21.701 - 0.000000207 \cdot X, \quad (3)$$

where *Y* – the proportion of the population with incomes below the subsistence level, %;

X – the volume of bank investments attracted in the sector of non-financial corporations, mil. rub.

The main parameters of the constructed model and the results of testing its validity are presented in *Table 5*. There is no autocorrelation between the errors in the model, and the errors in the model are normally distributed. Standard errors and p-values of the main regression parameters, as well as the Akaike, Schwartz and Hannan-Quinn information criteria confirm the statistical significance of the regression coefficients found. The model shows that the inflow of additional investment in the sector of non-financial corporations contributes to the reduction in the share of the population with incomes below the subsistence level in Russian regions.

The relationship established in the regression model is obvious, since the inflow of banking capital into enterprises of various spheres of economic activity in the form of lending and investment in equity and debt securities forms additional financial opportunities for their development, increasing production capacity. This positively affects not only the level of unemployment in the regions, but also the incomes of the population. The impact of bank investments attracted by non-financial corporations on the average monthly nominal accrued wages of employees is substantiated in the regression model with random effects that we constructed:

$$Y = 16389.9 + 0.00227 \cdot X, \quad (4)$$

where *Y* – the average monthly nominal accrued wages per employee, rub.;

X – the volume of bank investments attracted in the sector of non-financial corporations, mil. rub.

The model allowed establishing a direct correlation between the rate of wages of employees of enterprises and the volume of bank investments attracted to the sector of non-financial corporations. The inflow of banking capital in this sector of the

Table 5. Model of the impact of bank investments attracted by the non-financial corporation sector on the share of the population with incomes below the subsistence level in the RF constituent entities

	Coefficient	Standard error	t-statistics	P-value
<i>const</i>	21.701	0.317	68.33	0.000 ***
<i>X</i>	-2.07685e-06	1.03477e-06	-2.007	0.044 **
<i>R-squared</i> = 0,45	F (1, 1714) = 4.028		<i>P-value</i> (<i>F</i>)	0.0449 **
Schwartz criterion	13720.91		Akaike criterion	13710.01
			Hannan-Quinn criterion	13714.04
Distribution free Wald test for heteroskedasticity:			Chi-square (78) = 14290.7	14290.7
Wooldridge test for autocorrelation			Test statistics: <i>T</i> (77) = 135.441	2.362e-093 ***
The null hypothesis – the absence of a normal distribution			Chi-square (2) = 1193,87	5.67e-260 ***
Pesaran CD test for cross-sectional dependence Average absolute correlation = 0.863			Test statistics: <i>z</i> = 212.087	0.000 ***
Source: own compilation. ***, ** Statistical significance at the level of 1 and 5%, respectively.				

economy also has a positive impact on the balanced financial performance of enterprises in the regions of Russia:

$$Y = 63835.5 + 0.215 \cdot X, \quad (5)$$

where *Y* – the balanced financial result of enterprises, mil. rub.;

X – the volume of bank investments attracted in the sector of non-financial corporations, mil. rub.

According to the model built, the negative financial result of enterprises may be a consequence of the reduction of financial resources attracted by banks and loan institutions for enterprises of various types of economic activity, i.e. with the reduction of

lending and investment in corporate debt and equity securities, which was observed during the periods of economic recessions and the increase of crisis phenomena in the economy. Bank capital, attracted by the public administration sector, as shown by the panel regression model with fixed effects (*Tab. 6*), contributes to the reduction of the consumer price index in the regions of Russia:

$$Y = - 3.03843 - 0.000000373 \cdot X, \quad (6)$$

where *Y* – consumer price index (December of the current year to December of the previous year), %;

X – amount of bank investments attracted in the public administration sector, mil. rub.

Table 6. Model of the impact of bank investments attracted by the public administration sector on the dynamics of the consumer price index

	Coefficient	Standard error	t-statistics	P-value
<i>const</i>	-3.038	0.247	-12.32	2.15e-033 ***
<i>X</i>	-3.73603e-06	1.74912e-06	-2.136	0.0328 **
<i>R-squared</i> = 0.49	F (78, 1637) = 4.25		<i>P-value</i> (<i>F</i>)	1.03e-08 ***
Schwartz criterion	13341.29		Akaike criterion	12910.92
			Hannan-Quinn criterion	13070.17
Distribution free Wald test for heteroskedasticity			Chi-square (78) = 146.938	3.897e-006 ***
Wooldridge test for autocorrelation			Test statistics: <i>F</i> (1, 77) = 24.574	4.153e-006***
The null hypothesis – the absence of a normal distribution			Chi-square (2) = 8750.91	0.000 ***
Pesaran CD test for cross-sectional dependence Average absolute correlation = 0.844			Test statistics: <i>z</i> = 216.866	0.000 ***
Source: own compilation. ***, ** Statistical significance at the level of 1 and 5%, respectively.				

The reduction in the volume of bank investments in stocks of state-owned companies and debt securities of RF constituent entities and the volume of their lending cause the growth of the consumer price index in the regions. The consumer price index is a key indicator of inflation, in order to reduce it bank capital should be attracted to the public sector of the economy. This will increase the budgetary provision of the regions and form additional financial opportunities for the implementation of strategic initiatives and more effective solutions to acute problems of socio-economic development. However, on the other hand, the excessive inflow of bank investments in debt securities of the RF constituent entities and the high volume of bank lending of their public debt have a negative impact on the budget security of the regions.

At present, the consolidated budget revenues of the majority of the RF constituent entities depend on bank loans and investments in regional debt securities, which form the public debt of the RF constituent entities. The regression model with fixed effects allowed identifying a high level of indebtedness of the regions:

$$Y = 61244,8 - 0,4387 \cdot X, \quad (7)$$

where Y – revenues of the consolidated budgets of the subjects of the Russian Federation, mil. rub.;

X – amount of bank investments attracted in the public administration sector, mil. rub.

The model shows that in order to increase the revenues of the consolidated budgets of most regions, it is necessary to reduce the volume of bank resources coming into the budget of the subjects. As shown by our earlier research, in order to increase the budgetary security of the regions, the optimal solution is to reduce the volume of loans allocated by banks and loan institutions. Thus, the matrices of the movement of banking capital between institutional sectors and regression

modeling with the use of panel data built in the dynamics allowed assessing the impact of banking resources attracted by institutional sectors on the indicators of socio-economic development of Russian regions.

Conclusion

As a result of a review of the scientific literature, we found that the current statistical information does not provide an opportunity to accurately and objectively assess the impact of banking capital on the socio-economic development of territories. To solve this problem, we developed a methodological approach based on the methodology of forming balanced matrices of financial flows between institutional sectors using data from the primary accounting statements of loan institutions, the methodological principle of double-entry bookkeeping of the System of National Accounts and the methods of regression analysis using panel data. As a result of approbation of the methodological approach, we built matrices of financial flows in the regions, characterizing the processes of banking capital flows between the sector of financial and non-financial corporations, public administration, households and foreign institutions, as well as regression models characterizing the impact of bank investments attracted by each institutional sector on the indicators of socio-economic development of regional systems. The matrices of financial flows between the banking and other institutional sectors in Russian regions for the period from 1998 to 2019 show that the banking sector currently does not perform its traditional functions of saving capital and providing loans to the real sector of the economy, public administration and households, but carries out speculative policies, which contribute to a significant outflow of financial resources of these sectors abroad and harm the Russian economy.

Regression modeling revealed that the capital raised by banks in the sector of non-financial corporations has an impact on the dynamics of the gross regional product of the RF constituent entities, leads to a decrease in the unemployment rate in the regions, the number of population with incomes below the subsistence level, the degree of depreciation of fixed production assets, the increase in the balanced financial result of the activity of enterprises and the average monthly nominal wage of employees. The system of regression models and matrices of financial flows between the banking and other institutional sectors is, in our opinion, an effective tool for forming forecast scenarios of changes in the dynamics of socio-economic development of Russian regions in the medium term.

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Shadow Economy in Russia: Economic and Statistical Assessment of Its Scale and the Ways of Its Reduction in the Country and Regions



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Abstract. The shadow economy is one of the most complex socio-economic phenomena in almost any state. The shadow economy, which has become an integral structural element of an economic system, has a diverse and sometimes ambiguous impact on it. The nature and assessment of this phenomenon and the ways to deal with it have been in the focus of attention of scientists, government authorities, trade unions, and economic entities for a long time. Having reviewed the definitions of the shadow (underground) economy that are suggested by modern domestic and foreign sources, we consider this phenomenon as an economic activity of actors that are hidden from the influence of state control. In this regard, we can highlight the following priority areas of research: identification of factors that have a significant impact on the volume and nature of the shadow economy, development of measures to overcome it, and search for more adequate quantitative methods for its assessment at different levels of public administration.

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Of particular interest is the regional aspect of the shadow economy, which is not given due attention in publications. The article presents an attempt to compensate for this lack of attention. The aim of the work is to assess the scale of the shadow economy nationwide and in Russia's individual constituent entities on the basis of generalization of the methods applied and with the use of official statistical information of all-Russian agencies: the Federal State Statistics Service, the Federal Tax Service and their regional offices. Scientific novelty of the study lies in adjusting the traditional approach to the assessment of the shadow economy by the tax method, which consists in eliminating the amount of depreciation deductions from the indicators of gross profit of the economy and gross mixed income. The proposed method has been tested on the economy of Russia and several regions of the Central Federal District. We have revealed significant differences in the estimation of the scale of this phenomenon if various calculation methods are used. We review a set of measures aimed at reducing hidden income at the federal and regional levels, taking into account the current socio-economic situation complicated by the coronavirus pandemic.

Key words: shadow economy, indirect methods, hidden income, macro-level, meso-level, regional economy.

The influence of the “shadow economy expansion” has a negative impact on the entire socio-economic system of the country and its institutional foundations. The shadow economy has a negative impact on the overall structure of production and consumption, the competitive environment, the existing conditions of labor reproduction, the distribution of the tax burden, the budget process, the biosphere, and deforms social and psychological relations.

Since the concept of “shadow economy” is a complex and multicomponent term, there is a variety of approaches to its definition. It can be assumed that the diversity of positions on this issue is due, in particular, to differences in the nature of the theoretical and applied issues addressed by the authors, as well as in the research methodology and technique used by them, and the setting of objectives¹.

A significant contribution to the study of the problem was made by Russian scientists A.O. Afanas'eva [1], A.K. Bekryashev, V.Yu. Burov [2], E.V. Drobot [3], V.M. Zarubinskii, K.A. Seme-

renko [4], I.C. Ignat'ev², N.V. Kapitonova, A.A. Kapitonova [5], A.P. Kireenko [6], A.V. Kostin³, N.P. Kupreshchenko [7], Yu.V. Latov [8], A.S. Men'shikov [9], D.Yu. Fedotov, E.N. Nevzorova, E.N. Orlova [10], A.Z. Noven'kova [11], B.T. Ryabushkin, E.Yu. Churilova [12] and others.

A content analysis of individual approaches to defining the term “shadow economy” is presented in *Table 1*.

The signs of the shadow economy in terms used in foreign scientific literature are highlighted by A.P. Kireenko [6].

A number of studies devoted to theoretical, methodological and practical aspects of the definition and assessment of the shadow economy were conducted by H. Enste [13], F. Schneider [14; 15], E. Friedman, S. Johnson, D. Kaufmann, P. Zoido-Lobaton [16], Y. Eilat, C. Zinnes [17], R. Goel, J.W. Saunoris [18], V. Almenar, J. Sánchez, J. Sapena [19], A.N. Berdiev, J.W. Saunoris [20].

Generalization of these positions allows defining the shadow economy as a phenomenon of

¹ Bekryashev A.K. Shadow economy and economic crime. Omsk State University. Available at: <https://economics.studio/ekonomika-tenevaya/tenevaya-ekonomika-ekonomicheskaya-prestupnost.html> (accessed: August 10, 2020).

² Ignat'ev I.S. The shadow economy: Political-economic aspect: Candidate of Sciences (Economics) dissertation. Ivanovo, 2009. 24 p.

³ Kostin A.V. Modeling, measurement and mechanisms of the shadow economy in the Russian Federation: Candidate of Sciences (Economics) dissertation. Novosibirsk, 2014. 147 p.

Table 1. Approaches to the definition of the “shadow economy”

Author	Approach to the definition
H. de Soto	The shadow economy is defined as a special type of economic activity that evades official accounting and control and is often (but not always) illegal in nature ¹⁾
B.T. Ryabushkin, E.Yu. Churilova	The shadow economy is viewed from different perspectives: – As a prohibited type of economic and non-economic activity; – hidden production; – economic activity that, for one reason or another, is not accounted for by official statistics or escapes taxation; – hidden or prohibited economic activity ²⁾
V.Yu. Burov	The shadow economy includes only economic activities permitted by law, i.e., not including the completely criminal (“black”) part of the economy. At the same time, shadow economic activity must meet the following criteria: – it is carried out without official registration of the business entity (legal approach); – it is concealed from accounting (statistical approach); – it is socially and ethically harmful to society (social and ethical approach); – it causes economic damage to the state (economic approach) ³⁾
Yu.V. Latov	According to such attributes as the hidden nature of economic activity and the strength of the connection with the formal economy, there are three types of shadow economy: the second or “white-collar” economy, the informal economy, the “black” economy ⁴⁾
<p>Compiled according to:</p> <p>¹⁾ Latov Yu.V. The informal economy: The mysteries of three worlds. A review of Hernando de Soto's The Other Path. <i>Ekonomicheskaya teoriya prestuplenii i nakazanii. Referativnyi zhurnal. Neformal'nyi sektor ekonomiki za rubezhom=Economic Theory of Crime and Punishment. Abstract Journal. The Informal Sector of the Economy Abroad</i>. 2009, no. 3. Available at: http://corruption.rsuh.ru/magazine/2/n2-01.shtml (accessed: August 10, 2020).</p> <p>²⁾ Ryabushkin B.T., Churilova E.Yu. <i>Metody otsenki tenevogo i neformal'nogo sektorov ekonomiki: monografiya</i> [Methods for Assessing the Shadow and Informal Sectors of the Economy: Monograph]. Moscow: Finansy i statistika, 2003. 142 p.</p> <p>³⁾ Burov V.Yu. <i>Tenevaya ekonomika i maloe predprinimatel'stvo: teoreticheskie i metodologicheskie osnovy issledovaniya: monografiya</i>. [Shadow Economy and Small Business: Theoretical and Methodological Foundations of Research: Monograph]. Chita: Transbaikal State University, 2014. 204 p.</p> <p>⁴⁾ Latov Yu.V. <i>Ekonomika vne zakona. Ocherki po teorii i istorii tenevoi ekonomiki: monografiya</i> [Economics outside the Law. Essays on the Theory and History of the Shadow Economy: Monograph]. Moscow: Moscow Public Scientific Fund, 2001. 284 p.</p>	

the socio-economic sphere, which is the economic activity of business entities, hidden from the tools of state control.

Despite the apparent simplicity of determination, the parameters of the shadow economy cannot be accurately measured, since practically all the information needed by the researcher is classified or confidential. In such cases, indirect methods (micromethods) of estimation are applied, when open information is used, which allows applying the available information reflecting a certain correlation with the unrecorded volumes of production of goods and services.

The problem of determining the scale of the shadow economy at the level of individual territorial units of the country is even more significant. The specifics of the currently existing methods for assessing this phenomenon, as a rule, limit the possibilities of their application at the meso-economic level.

In Russia, official assessment of the shadow economy is carried out by authorized public authorities, such as the Federal Tax Service, the Federal State Statistics Service, the Federal Financial Monitoring Service, the Federal Service for Labor and Employment, etc. Various non-governmental organizations, news and analytical agencies (including foreign ones) also conduct their own studies of the shadow economy broken down by country and sector.

In 2018, the volume of the shadow economy reached 20% of GDP (103.6 trillion rubles), increasing in absolute terms by 1.8 trillion rubles (according to Rosfinmonitoring)⁴⁾. By comparison, this volume exceeds planned expenditures of the

⁴⁾ Financial intelligence estimated the volume of the shadow economy in Russia at 20 trillion. *Rosbizneskonsalting*. Available at: <https://www.rbc.ru/economics/22/02/2019/5c6c16d99a79477be70257ee?from=newsfeed> (accessed: July 20, 2020).

entire federal budget in 2019 (18 trillion rubles) by 2.7 trillion rubles, and in 2020 (19.5 trillion rubles) by 1.2 trillion rubles⁵.

Indeed, state budget losses from unrecorded economic activity of economic entities are very large. Only due to informal employment the lost revenue of the budget system of Russia is estimated annually at almost 3 trillion rubles (about 3% of GDP), of which 0.9 trillion rubles – losses due to non-payment of individual income tax from hidden income, 2.1 trillion rubles – insurance contributions to non-budgetary funds (according to the rating agency National Credit Ratings)⁶.

In 2019, the Research Center for Social and Political Monitoring of the Institute of Social Sciences (ISS) of RANEPA conducted a sociological survey, according to which 32.5% of Russian residents (about 25 million people) are involved in some form in the “shadow” labor market. Over the past fourteen years the number of unofficially employed people has decreased markedly (by 12.6%, down from 45.1% in 2006)⁷.

In addition to current and retrospective estimates of the scale of shadow economic activity and losses from it, there are studies devoted to the dynamics of its change in the future. A study on prospective estimates of the scale of the shadow economy by country, conducted by the International Association of Chartered Certified Accountants (ACCA) in 2017, showed that the shadow economy in Russia is estimated at 39.37% of GDP in relation to the year 2020. In terms of the shadow economy size in 2011, Russia ranked fifth among the top five

largest shadow economies in the world (39.33%) after Sri Lanka (39.5%). ACCA forecasts that in 2025 Russia will improve its ranking in this rating by one position, almost maintaining the scale of the shadow economy at the same level (39.3%) – fourth place after Ukraine (45.98% of GDP)⁸.

In the recent past, the Kaufman–Kaliberd method, or the energy consumption method, has been widely used to estimate the level of the shadow economy. It is based on the assumption that the dynamics of energy consumption should correspond to the dynamics of GDP. In this case, if there is a clear difference between the volume of energy consumption and the volume of GDP for a certain period, then this difference is associated with hidden production and is a shadow part of the economy.

A.V. Kostin⁹ made a contribution to the research and development of this approach. In his work, he proposed a modification of the Kaufman–Kaliberd method and estimated the proportion of the shadow economy in Russia (% of GDP), which allowed establishing the level of 45–54% in 2002–2011.

Another method, which among statisticians is considered an indispensable sign of high statistical culture, is the “commodity flow” method (cargo and commodity turnover). Its essence consists in the fact that for a particular commodity group the change in its value throughout the entire production path – up to the end use.

The purpose of applying the method is to discover weaknesses in the information base by constructing a balance model. The logic of the approach is as follows:

1. Determination of the total resources for the production of a particular commodity (production + import).
2. Determination of the total use of resources (final and intermediate consumption + accumulation + export).

⁸ *Emerging from the shadows: the shadow economy to 2025*. Available at: https://www.accaglobal.com/content/dam/ACCA_Global/Technical/Future/pi-shadow-economy-report.pdf

⁹ Kostin A.V. Modeling, measurement and mechanisms of the shadow economy in the Russian Federation: Candidate of Sciences (Economics) dissertation. Novosibirsk, 2014. 147 p.

⁵ On the federal budget for 2019 and for the planning period of 2020 and 2021: Federal Law no. 459–FZ dated November 29, 2018 (ed. December 02.12.2019), adopted by the State Duma on November 21, 2018; approved by the Federation Council on November 23, 2018. *SPS Konsul'tantPlyus*. Available at: <http://www.consultant.ru> (accessed: July 25, 2020).

⁶ Invisible citizens: 3 trillion rubles out of sight of the FTS due to shadow employment. *NKR Credit Rating Agency*. Available at: https://www.ratings.ru/files/research/macro/NCR_LaborStat_Dec2019.pdf (accessed: August 26, 2020).

⁷ The “shadow” labor market and proposals to reduce it. *Sociological Data Portal of RANEPA*. Available at: <https://www.ranepa.ru/images/News/2019-10/15-10-2019-ion.pdf> (accessed: July 3, 2020).

3. If there is a difference between the obtained indicators, it is necessary to decide which part of the information – the data on production or on imports – is more reliable, and use it to calculate the other part.

The principle of the method is very simple, but it is difficult to put it into practice. Virtually, the widespread implementation of the “commodity flows” method means that the balance method should be applied at the level of branch statistics.

In the Russian practice of assessing the shadow economy, this method is used quite rarely due to the complexity of its implementation.

The tax method (as a variation of the indirect method of discrepancies) makes it possible to estimate relatively fully and accurately the shadow money income in the GDP of the country as a whole. Also due to the availability of detailed information published in open sources with a sufficient level of detail, this method can also be used to estimate the shadow economy of individual regions, since, as a rule, there are no special assessments of the scale of the shadow economy at the regional level.

The tax method is based on the comparison of Rosstat data on the income received by the officially employed population with the data of the Federal Tax Service (FTS) of Russia on the tax base, from which taxes were actually paid to the corresponding budgets of the country. The volume of the shadow economy is calculated separately according to the Rosstat information on the profit received by all organizations in a particular year. Similarly, the hidden part of the economy is calculated on the basis of the Federal Tax Service data. The formula for calculating the scale of the shadow economy by the tax method is presented below (Formula 1):

$$\begin{aligned} GDP_S &= \frac{GDP - W - T_{Pr} - P_T(P_{St})}{GDP} \times 100\% = \\ &= \frac{P - P_T(P_{St})}{GDP} \times 100\%, \end{aligned} \quad (1)$$

where:

GDP – gross domestic product;

GDP_S – proportion of the shadow economy in the country's GDP, %;

W – wages of employees (excluding hidden wages and mixed income), that is, legal wages (without the shadow component);

P – gross profit of the economy and gross mixed income;

T_{Pr} – Net production taxes (corporate property tax, transport tax and land tax paid by legal entities, license fees);

P_T – legal profit included in the corporate income tax base;

P_{St} – profits recorded in the statistical reports of organizations.

The Federal Tax Service collects and analyzes information on the tax base and structure of corporate income tax accruals provided by economic entities in a report of the same name (Form No. 5–P). Aggregate information for the Russian Federation as a whole and by constituent entities is published on the FTS website¹⁰. The value of the tax base for calculating the tax in the report is taken as a P_T indicator to estimate the scale of the shadow economy of the country by the tax method.

A similar calculation is carried out using data from the official statistical yearbook and other publications of the Federal State Statistics Service (Rosstat, FSSS). In this case, the P_{St} indicator is taken as the amount of profit (loss) before taxation according to the accounting data on the full range of organizations of all forms of ownership (the relevant information is provided in the Unified Interagency Information and Statistical System (EMISS)). Rosstat publishes information on all of the above-mentioned indicators that make up the GDP_S formula.

The above information, according to some authors [10], is sufficient to estimate the scale of shadow economy. However, the proposed methodology does not consider that the indicator of

¹⁰ Report on the tax base and accrual structure of corporate income tax. Official website of the Federal Tax Service. Available at: https://www.nalog.ru/rn44/related_activities/statistics_and_analytics/forms/ (accessed August 5, 2020).

gross profit of the economy and gross mixed income (P) in its net form does not reflect the real volume of profit which can potentially be involved in the shadow economic turnover. This is due to the features of the Rosstat methodology used to calculate GDP “by income” (income approach). According to the accepted methodology, the indicator of gross profit and gross mixed income represents the part of value added that remains with producers after deduction of expenses related to salaries of employees and net taxes on production and imports. Consequently, this indicator includes the amount of consumption of fixed capital (consumption, depreciation), which overstates the possible amount of shadow turnover in the P indicator.

Thus, in order to improve the objectivity of the shadow economy assessment using the tax method, it is advisable to adjust the parameter P by the amount of depreciation of fixed assets of commercial and non-commercial organizations (this indicator is published in statistical yearbooks of Rosstat and is also recorded in the EMISS). One should note that this value reflects mainly the activity of large and medium-sized businesses, because it does not include the depreciation of fixed assets of small businesses (including individual entrepreneurs). In this case the formula will take the following form:

$$GDP_S = \frac{GDP - W - T_{Pr} - A_{CO} - A_{NCO} - P_T(P_{St})}{GDP} \times 100\% = \frac{P' - P_T(P_{St})}{GDP} \times 100\%, \quad (2)$$

where:

A_{CO} – amortization of fixed assets accrued for the reporting year in commercial organizations (without small business entities);

A_{NCO} – accrued accounting amortization of fixed assets for the year (amortization and depreciation recorded in accounting and reporting) of non-commercial organizations;

P' – gross profit of the economy and gross mixed income adjusted for depreciation.

Let us consider the application of the tax method for the analysis of shadow economic activity at the level of Russia as a whole, as well as individual regions (in the case of the Kostroma Oblast).

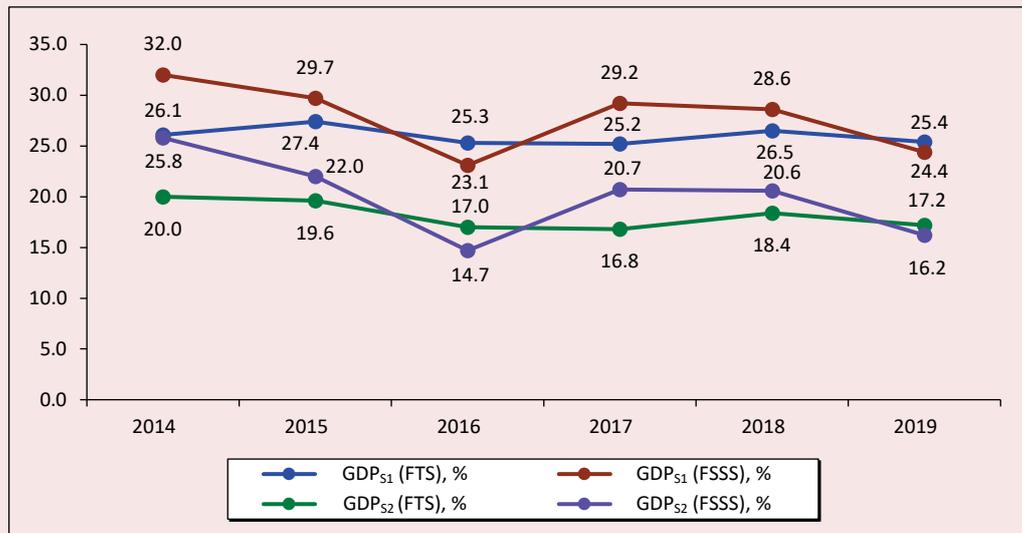
The results of calculating the volume of shadow income by the tax method before and after the adjustment (GDP_{S1} and GDP_{S2}) according to the information of the Federal Tax Service and Rosstat are presented in *Table 2* and *Figure 1*.

Figure 1 clearly shows how the scale of Russia's shadow economy has changed as a percentage of GDP, calculated by the tax method. At the same time, adjustment for the amount of accrued depreciation of fixed assets (depreciation) made it

Table 2. Application of the tax method to estimate the scale of Russia's shadow economy for the period 2014–2019

Indicator	2014	2015	2016	2017	2018	2019
GDP, billion rubles	79 030.00	83 087.40	85 616.10	91 843.20	104 629.60	110 046.00
W, billion rubles	37 439.00	39 748.90	41 237.50	43 897.50	47 107.30	50 321.10
T_{Pr} , billion rubles	10 998.40	9 263.80	9 405.00	9 973.10	11 906.20	12 526.10
P, billion rubles	30 592.60	34 074.70	34 973.60	37 972.60	45 616.10	47 198.80
A_{CO} , billion rubles	4 751.93	5 297.69	5 823.77	6 300.56	7 009.97	7 379.86
A_{NCO} , billion rubles	126.75	1 145.90	1 350.60	1 457.51	1 427.68	1 629.58
P' , billion rubles	25 713.92	27 631.11	27 799.23	30 214.53	37 178.45	38 189.36
P_T , billion rubles	9 943.26	11 330.24	13 282.70	14 830.09	17 940.46	19 234.19
P_{St} , billion rubles	5 341.79	9 366.04	15 178.37	11 169.99	15 658.62	20 373.24
GDP_{S1} (according to the FTS), % of GDP	26.1	27.4	25.3	25.2	26.5	25.4
GDP_{S1} (according to the FTS), % of GDP	32.0	29.7	23.1	29.2	28.6	24.4
GDP_{S2} (according to the FTS), % of GDP	20.0	19.6	17.0	16.8	18.4	17.2
GDP_{S2} (according to the FTS), % of GDP	25.8	22.0	14.7	20.7	20.6	16.2
Compilation according to: Rosstat data, EMISS, FTS.						

Figure 1. Dynamics of the shadow economy in Russia in 2014–2019 (before and after adjustment), % of GDP



Source: own compilation.

possible to clarify the estimate of Russia's shadow economy and avoid its overestimation by 6% to 8.5%. Further analysis was carried out on the basis of the adjusted GDP_{S2} indicators.

The data in Figure 1 shows that the indicators of the volume of the shadow economy, calculated using Rosstat information, differ more from the indicators calculated on the basis of tax reporting data (except for 2016), due to differences in the methodology of formation of the indicator reflecting the officially registered profit of economic entities.

The largest fluctuations of latent GDP are shown in the graph based on Rosstat data. The graph of the dynamics of the analyzed indicator calculated on the basis of the FTS data is more logical and demonstrates insignificant changes since 2016. Since 2014, there has also been a general downward trend in the volume of the shadow economy as calculated by the FSSS.

Researchers of the tax method believe that the data recorded in the tax, rather than statistical reporting is more reliable, because there are penalties for misrepresentation of tax data, which encourages organizations to provide reliable information.

Over the 2014–2019 period under review, the shadow part in the total amount of profits in Russia's GDP is estimated to vary between 14–26%, and 16–20%, using data from the FSSS. In 2019, the volume of shadow income in GDP is estimated to be about 17.8 trillion rubles, and 18.9 trillion rubles, based on data from the Federal Tax Service.

For the period 2014–2019 under review, the shadow part of the total profit in Russia's GDP varies in the range of 14–26% according to estimates using FSSS data, 16–20% using FTS data. In 2019, the volume of shadow incomes in GDP amounted to about 17.8 trillion rubles according to calculations based on FSSS data, and 18.9 trillion rubles, based on data from the FTS.

Further, we carried out an assessment of the shadow economy at the meso-level (in the case of the Kostroma Oblast) using the tax method. The calculation was carried out similarly according to the methodology and formulas presented above. However, the sources of the basic statistical information about the volumes and structure of GRP of the region were collections, reports and publications of the corresponding territorial body of the Federal State Statistics Service (in our case

Kostromastat). The information about the tax base for the profit tax calculation according to the FTS data is also presented in the reports according to the form of statistical tax reporting No. 5–P by subjects.

The calculation results of the shadow economy scale of Kostroma Oblast before and after the adjustment are shown in Table 3 and Figure 2.

The values of the proportion of shadow income in GRP of the Kostroma Oblast vary

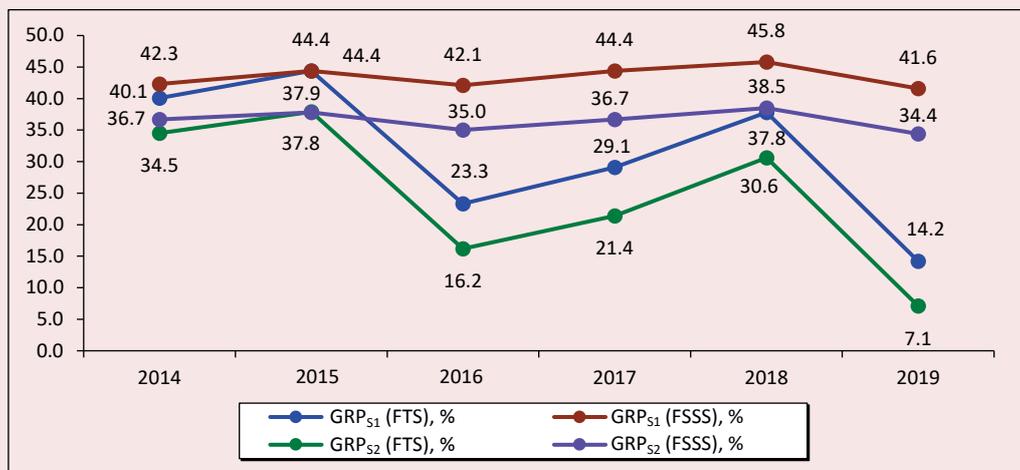
considerably depending on the source of information about the profit of organizations for the year. The adjustment of the gross profit indicator of the economy and gross mixed income by the volume of depreciation of the main funds of commercial and non-commercial organizations noticeably decreased the resulting indicator by the amount from 5.6 to 7.7% depending on the specific period.

Table 3. Application of the tax method to determine the scale of the shadow economy in the Kostroma Oblast for the period 2014–2019

Indicator	2014	2015	2016	2017	2018	2019
GRP, million rubles	146 731.50	160 579.80	158 127.50	166 945.30	180 287.20	191 450.80 ¹
W, million rubles	70 428.80	72 624.80	73 833.40	80 202.60	87 546.90	95 038.10 ¹
T _{Pr} , million rubles	2 288.90	2 440.20	2 329.70	2 474.20	2 755.10	2 761.50 ¹
P, million rubles	74 013.80	85 514.80	81 964.40	84 268.50	89 985.20	93 651.20 ¹
A _{CO} , million rubles	7 914.00	8 293.00	8 965.00	10 291.12	10 487.38	11 449.18
A _{NCO} , million rubles	321.00	2 258.00	2 294.00	2 640.27	2 638.84	2 197.43
P _{>} , million rubles	65 778.80	74 963.80	70 705.40	71 343.11	76 858.98	80 004.59
P _T , million rubles	15 105.78	14 154.20	45 066.77	35 684.86	21 757.06	66 448.89
P _{St} , million rubles	11 894.49	14 235.65	15 421.20	10 089.37	7 363.95	14 096.75
GRP _{S1} (according to the FTS), % of GDR	40.1	44.4	23.3	29.1	37.8	14.2
GRP _{S1} (according to the FSSS), % of GDR	42.3	44.4	42.1	44.4	45.8	41.6
GRP _{S2} (according to the FTS), % of GDR	34.5	37.9	16.2	21.4	30.6	7.1
GRP _{S2} (according to the FSSS), % of GDR	36.7	37.8	35.0	36.7	38.5	34.4

¹ according to the first estimate of Rosstat.
Compilation according to Rosstat, Kostromastat, EMISS, FTS data.

Figure 2. Dynamics of the shadow economy in the Kostroma Oblast in 2014–2019 (before and after adjustment), % of GRP



Source: own compilation.

The calculation of the volume of the region's shadow economy according to the FTS of Russia shows a clear downward trend (from 34.5% in 2014 to 7.1% in 2019), while the graph of the shadow part of the region's GRP, obtained using data from the FSSS and Kostromastat on profit before taxation, shows less variability. According to the data adjusted for depreciation, the value of the shadow part of the GRP of the region for the period under consideration was in the corridor of 34.4–38.5%.

In 2019 the value of shadow profit in GRP of the Kostroma Oblast was about 65.9 billion rubles according to calculations based on data from FSSS and Kostromastat, and 13.6 billion rubles based on data from the FTS.

For comparison, we present calculations of the dynamics of the shadow part of GRP by the tax method for four regions (Vladimir, Ivanovo, Yaroslavl, and Kirov oblasts), adjusted for the value of depreciation according to the FTS (Fig. 3) and the FSSS (Fig. 4).

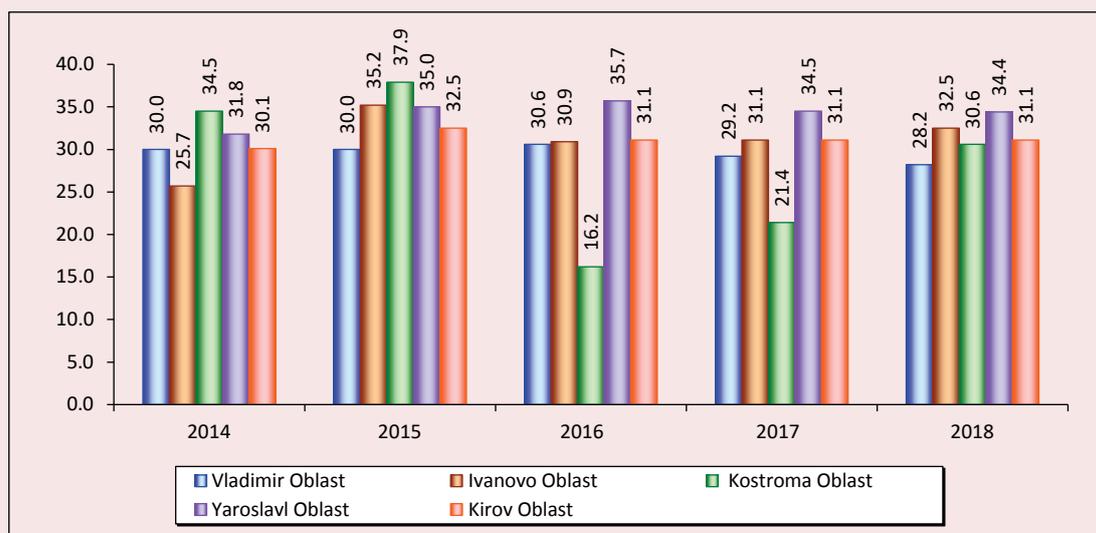
The data presented in Figures 3 and 4 clearly demonstrate a significant difference in the results depending on the selected data source. Thus, Figure 3 shows a clear preponderance in the volume of

the shadow part in the GRP of the region in the Yaroslavl Oblast in 2016–2018. At the same time, over the same period the Kostroma Oblast shows an improvement in the size of the shadow economy (reduction of the indicator, especially in 2016 – 16.2%). The histogram of the Vladimir Oblast also shows the most stable downward dynamics.

The histogram in Figure 4, constructed using data from the FSSS on profit before taxation, shows a different situation. Relative to other regions, the volume of shadow income in the GRP of the Kostroma Oblast is quite high, but the largest proportion of “shadow” in the region's GRP was recorded in 2017 in the Vladimir Oblast (43.1%). According to Figure. 3, the shadow income in the GRP of the Kirov Oblast shows a more stable dynamic.

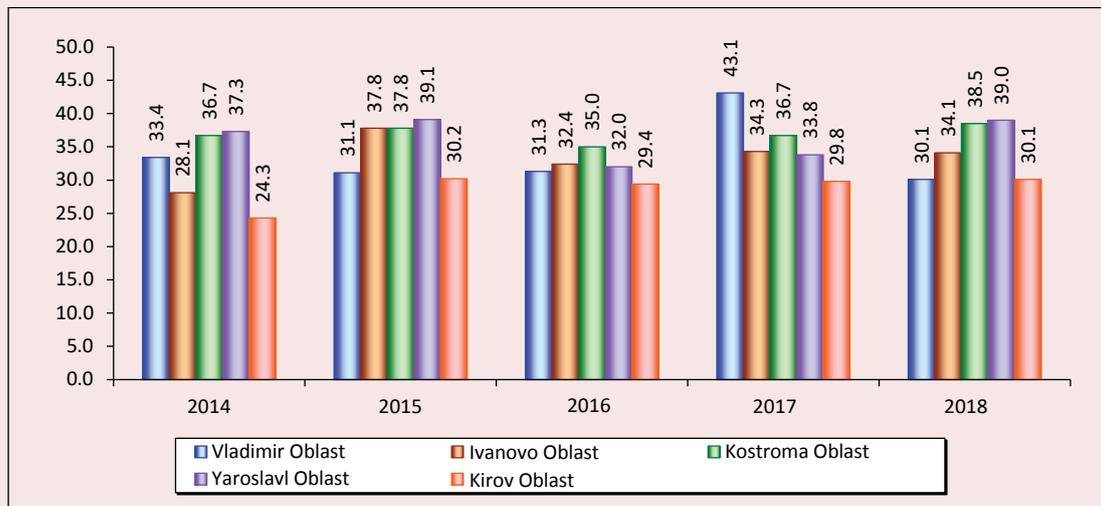
The calculation results show that the value of the shadow part of GDP in percentage terms at the macro-level is lower than the same indicator in the GRP of the territorial constituent entities under consideration. At the same time, while for Russia as a whole there is a positive dynamics (i.e., reduction of the shadow part of GDP), broken down by region not everything is so unequivocal, therefore, it is

Figure 3. Dynamics of the shadow economy broken down by oblast in 2014–2018 (using data from the FTS), % of GRP



Source: own compilation.

Figure 4. Dynamics of the shadow economy broken down by oblast in 2014–2018 (using data from the FSSS), % of GRP



Source: own compilation.

necessary to pay extra attention to particular regions with the highest proportion of the shadow economy in the country’s GDP (GRP_s).

Active work of political and socio-economic institutions of the state is required to develop effective measures to counteract the expansion

and further reduction of the shadow economy. Particularly promising are preventive measures to encourage economic agents to come out of the “shadow” on their own and to conduct their activities legally. The most important measures currently being taken include the following (Tab. 4).

Table 4. Measures to reduce the shadow economy

Measure	Purpose	Concept	Result
Bank of Russia regulation	Reducing capital outflows from the country, accompanied in parallel by ridding the system of weak players or those with risky credit policies	Currency regulation and control ¹⁾ , revocation of licenses from unscrupulous banks	Over the period of 2005–2016, more than 750 licenses were revoked by the Bank of Russia. The capital outflow from the country due to dubious transactions decreased to 0.5 billion USD by 2016 ²⁾
	Providing necessary information about the risk level of involvement in dubious transactions of potential and existing clients of banks	Launch in the latter half of 2021 a platform for banks “Know Your Customer”	The platform will allow allocating bank customers to risk zones based on objective criteria in terms of transactions for the purposes of money laundering and terrorist financing
Federal Law No. 115–FZ, dated August 7, 2001 “On countering the legalisation (laundering) of criminally obtained incomes and the financing of terrorism” ³⁾	Protecting the rights and legitimate interests of citizens, society and the state by creating a legal mechanism to counter the legalisation (laundering) of proceeds of crime, terrorist financing and the financing of proliferation of weapons of mass destruction.	Regulation of issues in the field of countering money laundering, financing of terrorism, proliferation of weapons of mass destruction	Reduction in the volume of dubious transactions: in 2020, the volume of money withdrawal abroad in the banking sector decreased from 816 billion rubles in 2014 to 53 billion rubles. The volume of cash-out transactions in the banking sector also decreased, from 681 billion rubles in 2014 to 78 billion rubles in 2020 ⁴⁾

Continuation of Table 4

Measure	Purpose	Concept	Result
Federal Law No. 376–FZ, dated November 24, 2014 “On amending Parts I and II of the Russian Federation Tax Code (in respect of taxation of the profits of controlled foreign companies)” ⁵⁾	Increasing tax collection, making it harder to launder criminal money, and greater clarity about business owners	The law for the first time: <ul style="list-style-type: none"> – introduces a mechanism of taxation in Russia of controlled foreign companies’ profits (primarily offshore companies); – changes the rules for recognizing organizations as tax residents of the Russian Federation by introducing the criterion of “place of actual management”; – substantially supplements the norms of the Tax Code of the Russian Federation on the taxation of income of foreign organizations; – restricts the application of international double taxation treaties by means of the “actual recipient of income” rule⁶⁾ 	Adjustment of the existing tax legislation partially allowed increasing tax collection
Federal Law No. 129–FZ, dated August 8, 2001 “On state registration of legal entities and individual entrepreneurs”	Reducing the number of fly-by-night companies	Updating the FTS registry information on invalid data, mass addresses and “mass signers”	By early 2016, the number of fly-by-night companies had dropped from 45% to 15% of the number of registered companies; in 2018, the proportion of such companies in Russian business fell to an all-time low of 7% ⁷⁾
Federal Law No. 54–FZ, dated May 22, 2003 “On the use of cash registers for settlements in the Russian Federation” ⁸⁾	Reduction of unrecorded physical cash flow and the practice of payment of under-the-table wages by organizations and individual entrepreneurs	Introduction of mandatory online cash registers	As a result of these measures, unaccounted physical cash flow is disappearing, both in retail and at all suppliers and manufacturers. Gray wages are also becoming a thing of the past: businesses are depleting their sources of unaccounted cash to pay backdoor salary.
Digitalization	Increasing state control over the cash flow. Increasing transparency of transactions and the ability to fight corruption, illegal transactions, and tax evasion by citizens	Avoiding cash in settlements; Blockchain Technology; Cryptocurrency.	In 2020, the Federal Law No. 259–FZ, dated July 31, 2020 “On digital financial assets, digital currency and on amendments to certain legislative acts of the Russian Federation” ⁹⁾ was adopted, which at the legislative level secured the use of such funds.
Federal Law No. 172–FZ, dated June 8, 2020 “On amending Part II of the Russian Federation Tax Code” ¹⁰⁾	Support and economic recovery during the COVID-19 pandemic. Economic support for economic entities (especially small and medium-sized enterprises (SMEs))	Expansion of economic assistance measures and tax relief from the state for business entities most affected by the COVID-19 pandemic	The following categories of taxpayers are exempted: <ul style="list-style-type: none"> – Individual entrepreneurs engaged in the most affected industries; – legal entities included on the basis of 2018 tax returns in the register of SMEs, engaged in the most affected sectors of the economy; – legal entities included in the register of SONPOs, which since 2017 are recipients of grants of the President of the Russian Federation, subsidies and grants under special programs; – centralized religious organizations, SONPOs established by them, as well as religious organizations included in the structure of centralized religious organizations; – non-commercial organizations included in the register of those most affected by the spread of a new coronavirus infection

End of Table 4

Measure	Purpose	Concept	Result
Decree No. 434, dated April 3, 2020 "On approval of the list of sectors of the Russian economy, most affected by the deterioration of the situation due to the spread of a new coronavirus infection" ¹¹⁾	Support and economic recovery during the COVID-19 pandemic. Economic support for economic entities (especially small and medium-sized enterprises (SMEs))	Direct financial assistance to small and medium-sized organizations and individual entrepreneurs from the most COVID-19-affected sectors of the economy on a non-repayable basis	Mitigating the effects of the pandemic on SMEs and supporting the functioning of business entities
National project "Small and medium sized businesses and support of individual entrepreneurial initiatives"	Comprehensive improvement of the business climate in Russia	Its structure includes five federal projects: – expanding SMEs' access to financial resources, including concessional financing; – improvement of conditions for doing business; – acceleration of SME subjects; – creation of a support system for farmers and the development of rural cooperation; – popularization of entrepreneurship	The projects are aimed at increasing the number of people employed in small and medium-sized businesses to 25 million by 2024, increasing the share of SMEs in the country's GDP to 32%, and the share of exports from SMEs to 10% of the total

¹⁾ Federal Law No. 173–FZ, dated December 10, 2003 "On Currency Regulation and Currency Control". (amended December 8, 2020): adopted by the State Duma on November 21, 2003; approved by the Federation Council on November 26, 2003. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_45458/ (accessed: December 21, 2020).

²⁾ Danilov A. The unnecessary players. Cleansing of the banking sector is a reaction to the outflow of capital from the country. *Forbes*, 2017. Available at: <https://www.forbes.ru/finansy-i-investicii/341387-lishnie-igroki-chistka-bankovskogo-sektora-eto-reakciya-na-ottok> (accessed: December 23, 2020).

³⁾ Federal Law No. 115–FZ, dated August 7, 2001 "On countering the legalisation (laundering) of criminally obtained incomes and the financing of terrorism" (ed. December 8, 2020): adopted by the State Duma on July 13, 2001; approved by the Federation Council on July 20, 2001. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_32834/ (accessed: December 21, 2020).

⁴⁾ Anti-money laundering and currency control. *The Bank of Russia: official website*. Available at: https://cbr.ru/counteraction_m_ter/ (accessed: December 22, 2020).

⁵⁾ Federal Law No. 376–FZ, dated November 24, 2014 "On amending Parts I and II of the Russian Federation Tax Code (in respect of taxation of the profits of controlled foreign companies) (amended November 12, 2018): adopted by the State Duma on November 18, 2014; approved by the Federation Council on November 19, 2014. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_171241/ (accessed: December 20, 2020).

⁶⁾ Zozulya T. Dangerous trends in tax control 2020. *Klerk*. 2020. Available at: <https://www.klerk.ru/blogs/zozula/495489/> (accessed: 24.12.2020).

⁷⁾ Vodchits D. Fake Business. How Russia is struggling with fly-by-night companies. *Forbes*, 2018, July 9. Available at: <https://www.forbes.ru/biznes/364015-nenastoyashchiy-biznes-kak-v-rossii-boryutsya-s-firmami-odnodnevkami> (accessed: December 24, 2020).

⁸⁾ Federal Law No. 54–FZ, dated May 22, 2003 "On the use of cash registers for settlements in the Russian Federation" (ed. October 1, 2020): adopted by the State Duma on April 25, 2003, approved by the Federation Council on May 14, 2003. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_42359/ (accessed: December 20, 2020).

⁹⁾ In 2020, the Federal Law No. 259–FZ, dated July 31, 2020 "On digital financial assets, digital currency and on amendments to certain legislative acts of the Russian Federation": adopted by the State Duma on July 22, 2020, approved by the Federation Council on July 24, 2020. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_358753/ (accessed: December 21, 2020).

¹⁰⁾ Federal Law No. 172–FZ, dated June 8, 2020 "On amending Part II of the Russian Federation Tax Code": adopted by the State Duma on May 22, 2020, approved by the Federation Council on June 2, 2020. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_354470/ (accessed: December 21, 2020).

¹¹⁾ Decree No. 434, dated April 3, 2020 "On approval of the list of sectors of the Russian economy, most affected by the deterioration of the situation due to the spread of a new coronavirus infection". *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_349344/ (accessed: December 22, 2020).

The listed measures are of a concrete practical nature, that is, they are already being carried out today by authorized state bodies and organizations.

With regard to economic support for economic entities (especially small and medium-sized enterprises (SMEs)), measures of economic assistance and tax relief from the state are expanding. This is most clearly seen during the coronavirus pandemic. For example, under Federal Law No. 172–FZ, dated June 8, 2020 “On amendments to Part II of the Tax Code of the Russian Federation” certain categories of taxpayers are exempt from paying taxes¹¹. It seems significant and symbolic that the epidemic has actualized the importance and effectiveness of transparent business conduct, since substantial financial support was provided to those business entities that submitted appropriate reporting of their economic activities.

The affected industries The Russian Government approved by the Decree No. 434, dated April 3, 2020 “On approval of the list of sectors of the Russian economy, most affected by the deterioration of the situation due to the spread of a new coronavirus infection”. The list includes catering, services and entertainment, hospitality, cinemas and other industries¹².

It is important to note that most regions have their own measures to support SMEs. For example, in the Kostroma Oblast there is a Decree of the Kostroma City Administration dated September 18, 2019 No. 1721 “On approval of the procedure for granting subsidies from the Kostroma city budget to small and medium-sized businesses that are

¹¹ Federal Law No. 172–FZ, dated June 8, 2020 “On amending Part II of the Russian Federation Tax Code” (amended October 15, 2020): adopted by the State Duma on May 22, 2020, approved by the Federation Council on June 2, 2020. *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_354470/ (accessed: December 20, 2020).

¹² Decree No. 434, dated April 3, 2020 “On approval of the list of sectors of the Russian economy, most affected by the deterioration of the situation due to the spread of a new coronavirus infection” (amended October 16, 2020). *SPS Konsul'tantPlyus*. Available at: http://www.consultant.ru/document/cons_doc_LAW_349344/ (accessed: December 22, 2020).

engaged in priority economic activities for the city of Kostroma for partial compensation of costs”, according to which in case the SME subject may be provided with a tender for a particular area:

- partial reimbursement of expenses on payment of interest for the use of funds under credit agreements;
- partial reimbursement of expenses for training or advanced training of small and medium-sized businesses and their employees;
- partial reimbursement of expenses for participation in exhibitions and fairs¹³.

In addition, thanks to the efforts of the administration and the business community of the Kostroma Oblast, the production of jewelry, which is one of the main economic activities in the Oblast, was added to the list of affected industries.

Therefore, a set of measures is implemented to counteract the shadow economy and its “whitewashing” both at the national level and at the level of individual regions in particular. At the same time, measures are not limited to coercive, punitive and prohibitive impact. It is encouraging that incentives and financial assistance are also carried out at the state level and prove their effectiveness.

Conclusion

The difference in approaches of the leading economic departments (the Federal State Statistics Service and the Federal Tax Service) to determining the scale of the shadow economy at the macro- and meso-economic levels was actualized, which manifests itself in a significant discrepancy in its volumetric indicators.

An improved method for determining the shadow economy, based on the adjustment of the amount of depreciation of fixed assets indicators of

¹³ Decree of the Kostroma City Administration dated September 18, 2019 No. 1721 “On approval of the procedure for granting subsidies from the Kostroma city budget to small and medium-sized businesses that are engaged in priority economic activities for the city of Kostroma for partial compensation of costs”. *Kodeks: electronic fund of legal and normative-technical information*. Available at: <http://docs.cntd.ru/document/561557333> (accessed: December 21, 2020).

gross profit and gross mixed income of commercial and non-commercial organizations, which increases the objectivity of the assessment of the shadow economy, is proposed. This method has demonstrated its applicability both in assessing the shadow economy at the macro-level (on the national scale) and at the meso-level (five constituent entities of the Russian Federation).

Structured, broken down by institutional set of tools, a set of measures to “whitewash” the shadow

economy, as well as consider regional actions that contribute to the exit of the economy “out of the shadows”, considering the features of the pandemic coronavirus.

We have structured a set of measures to “whitewash” the shadow economy, broken down by institutional set of tools, and considered regional actions to facilitate the exit of the economy “out of the shadows”, considering the features of the pandemic coronavirus.

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Working Out Social Guidelines for the Industry Development of Metallurgy



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Abstract. At present, traditional methods used in forecasting the development of economic sectors no longer provide acceptable results; thus it becomes relevant to work out new methods and approaches to industry forecasting. The paper proposes an approach to forecasting the development of industries under the influence of processes taking place in the social sphere. We consider major contradictions caused by the influence of metallurgical production on the formation of socio-economic conditions in Russia. We show that social factors played a significant role in making decisions on the establishment of metallurgical enterprises and the management of the metal market. We highlight major social functions performed by metallurgy. The study of the commodity market of metal products is supplemented by an analysis of changes in the positions of metallurgical enterprises in the capital market and the labor market. We note that social expenditures help metallurgical companies to gain public recognition of their performance results and change the level of their capitalization. This made it possible to develop a methodological approach to assessing the prospects of industry development with the use of guidelines for Russia's social development. We propose to use the following economic criterion: assessment of accumulation of funds invested in the development of production, preservation and growth of capital. We estimate social impact generated by development of metallurgical production under various scenarios of managing the decision-making system in Russia. We compare a business-oriented scenario, a scenario involving state paternalism, and a scenario of radical social transformations. We substantiate the conclusion about the

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advantages that the social variant of development of the state provides for creating a promising image of national metallurgy. This scenario will ensure high dynamics of metal production, growth of business capitalization and quality of life in Russia.

Key words: industry forecasting, metallurgy, metal market, social factors, social guidelines, development scenarios.

Introduction

The traditional scheme of economic forecasting of industrial development processes increasingly leads to estimates that conflict with the phenomena, observed in practice. For instance, despite the 2.2-fold increase in global demand for metal in 2000–2020 (from 850 to 1878 million tons of steel), countries with developed metallurgy practically did not participate in its satisfaction. The contribution of the USA, the EU, Japan, and the Russian Federation to the increase in the output of cast iron and steel was negative and amounted to minus 8%¹. No wonder that the improvement in metal prices is not accompanied by the expansion of its production, and the growth of corporate income does not contribute to the inflow of investments into the industry. For example, steel production in Russia turned out to be stable during 2012–2020 (about 71 million tons) with a 1.6-fold increase in world metal prices over this period. An increase in the companies' profit for 2017–2020 by about 1 trillion rubles led to investments growth in metallurgy by less than 200 billion rubles, and in comparable prices investments even decreased by 8.5%². It is pointless to try to explain it from the standpoint of the theory of market equilibrium, competition, etc.

Currently, there is no clear generally accepted idea about what alternative business solutions may appear around, what resources are necessary to

develop metallurgy in modern conditions. It is obvious that the availability of mineral reserves, monetary funds and experience in metallurgical activities are no longer sufficient prerequisites for the successful development of metallurgy. And this is not only Russian practice. We should recall the success of Japan in the 1970s and the Republic of Korea in the 1990s. Another example is France, which is one of the ten largest countries in terms of reserves of iron ore raw materials and one of the twenty leading metal producers, but 90% meets the needs for metal products due to imports with a rich history of the development of metallurgical technologies and industries [1].

New countries and companies are emerging with developments that attract the global metallurgy. The leaders of coke-free metallurgy (direct reduction of iron) are Iran and Mexico. The growth of steel and rolled products based on the latest technologies is observed in the countries of the Middle East, Southeast Asia, and North Africa. Interesting developments in the production of metal products are demonstrated by Austria, Switzerland, and the Netherlands. *To understand what is happening on the metal market, it is necessary to investigate the motivation system for economic decisions and expand the set of factors, used in forecasting the industry development.*

A new logic of substantiation of management decisions is being formed, when actions that are not directly related to profit extraction are justified. It is advisable to consider many phenomena in the metal products market more broadly than is customary in economic analysis, primarily in the context of the

¹ Statistical reports. Worldsteel. Available at: <https://www.worldsteel.org/steel-by-topic/statistics/steel-statistical-yearbook.html> (accessed: June 16, 2021).

² Unified Interdepartmental Statistical Information System. Available at: <https://www.fedstat.ru/> (accessed: August 1, 2021).

Sustainable Development Goals [2]. From this point of view, assessments of the situation in metallurgy in the 2020s turn out to be contradictory and the results of the activities of leading companies are being criticized more and more often. The use of social drivers of competition has noticeably increased in the 2000s, especially in the confrontation between the “old” and “new” metallurgy (created in new industrial countries). In the EU and the USA, the conflict between the economic interests of business and the social tasks of the state has escalated. The main goals of protectionism include the survival of business and protection of workplaces (additional income does not cover the emerging social costs). Of the measures, introduced in 1995–2016 (a total of 1,051), 222 fall on the USA, 124 on the EU. Metallurgy products account for 5.1% of all notified non-tariff measures in trade (according to the WTO-I-TIP system). In the 2010s, there was a steady increase in the compensation measures (from 1.5 measures on average in the 2000s to 6.5 in 2010–2017), and anti-dumping measures (from less than 1 in the 2000s to 3 in 2010–2017) [3]. A new stage of confrontation in the metal market has adjusted the decision-making mechanism. In 2017–2019, the number of initiated investigations increased abruptly. Companies began taking on voluntary commitments to limit supplies and their conditions. The practice of concluding interstate supply agreements is expanding [1].

Along with the use of social factors in the competition, real problems cannot be ignored. There are numerous examples of the connection of metallurgy (24.4% of all emissions into the atmosphere in the Russian Federation) with the negative environmental situation in the regions where production is located. Difficult working conditions (over 70% are employed in harmful and dangerous conditions)³ result in a low life

expectancy of workers. The presence of specific diseases in the locations of enterprises is pointed out in numerous Russian and foreign studies [4; 5]. Contradictions of transnational nature are growing in the world. Increasingly, the benefits of some countries and population groups are the result of the destruction of the environment and public health in other countries. This is a consequence of the action of economic mechanisms and the logic of industry development set by them in the conditions of the global market including the metal market. Economic ways to eliminate the existing contradictions (prices, investments, profitability) turned out to be ineffective [6].

Russia and many other states have not yet managed to avoid the growing negative social implications of industrial activity. The situation in Eastern European countries was quite typical, when metallurgical enterprises (with assets worth hundreds of millions of dollars) were sold for one dollar, but with the obligation of the new owner to eliminate the accumulated negative environmental effect [7]. In the now prosperous metallurgical Russian regions, it is advisable to avoid the fate of metallurgy in the Ruhr region, the Great American Lakes or the old industrial areas of the Urals⁴.

The positive development of metallurgy presupposes the restoration of the link between the state of the industry and living standards of citizens. Historically, steel production per capita has been the most important indicator of the economic development rate of the country [8]. Metal consumption per capita still characterizes the state's economy (*Tab. 1*). However, due to the global nature of modern economic development processes, everything is complicated, as it was in the 19th–20th century. The dynamics of metal production in many world countries, especially industrially developed ones, no longer has a direct connection

³ Environmental protection in Russia. Statistical collections for 2006–2020. Available at: <https://rosstat.gov.ru/folder/210/document/13209> (accessed: August 07, 2021).

⁴ Lyakishev N.P. et al. *Encyclopedic Dictionary of Metallurgy: Reference Edition in 2 Volumes*. Volume 1. Moscow: Internet Inzhiniring, 2000. 412 p.

Table 1. Parameters of economic development and metal consumption in the world

GDP per capita, thousand USDs	Steel consumption per capita, kg	Representative countries
Over 40	Over 300	USA, EU, Japan, Republic of Korea
From 20 to 40	200–300	RF, Turkey, Mexico
From 10 to 20	100–200	Brazil, Iran, UAE, RSA
Less than 10	Less than 100	India, African and Latin American countries

Source: Statistical reports. Worldsteel. Available at: <https://www.worldsteel.org/steel-by-topic/statistics/steel-statistical-yearbook.html> (accessed: June 16, 2021); World Bank Open Data. Available at: <https://data.worldbank.org/> (accessed: June 16, 2021).

with changes in living standards. Situations are multiplying (in countries with transformational economies) when population incomes decrease in order to improve the price competitiveness of production. The widespread technocratic opinion is also fair; it says that enterprises, created in the last century and based on the technological principles of the century before last, are difficult to recognize as the basis of the future welfare of the country [7].

Along with the negative assessments, typical of the journalism of the end of the 20th century, positive changes in views on the development of the world metallurgy are increasingly noted. They are based not on economic logic, but on technocratic and social approaches to assessing the formation of the future. Experts in the field of technological forecasting consider progress in materials and production methods as the most important directions of global changes and social transformation [9]. In the 2010s, the average annual increase in the production of metal-ceramic products using 3D technologies was estimated at about 17%, materials with nano-coating demonstrate an annual growth of 1.5–2⁵ times. New directions are being formed to meet the needs associated with the use of metal (restoration technologies, surface protection, secondary use of resources, etc.). The logic of the transition from disposable products to long-term use of resources

⁵ Forecasts of socio-economic development. *Ministry of Economic Development of the Russian Federation*. Available at: https://www.economy.gov.ru/material/directions/makroec/prognozy_socialno_ekonomicheskogo_razvitiya/ (accessed: August 23, 2021).

is gradually receiving social support. The potential for maintaining products in operation has been formed after a period of wasteful consumption (an increase in service life by 5–10 years). Extending the service life of metal products for a year gives an effect equivalent to the additional production of 200–250 million tons of steel in the world.

Technological and price prerequisites are a secondary factor in the most likely scenarios of changes in metallurgy. The introduction of continuous steel casting, baked anodes in the production of aluminum and other world-proven developments stretched in Russia for decades. The analysis shows that the speed of propagation of technological waves after the acceleration stage (20th century) is noticeably reduced [5]. Many technologies become in demand only in proper social conditions [10; 11]. It is for this reason that in global practice it is customary to call a “miracle” the large-scale application of proven effective technologies (Japan, South Korea, Singapore, etc.).

Thus, two main facts determine the social aspect of metallurgy development in the country. *First, metal is necessary to create a comfortable environment that increases the citizens' well-being. Second, society bears the costs, associated with the negative impact of metallurgy on the environment*, with the consumption of public infrastructure resources and public resources (mineral resources, knowledge, and human capital) by metallurgy. We observe an ongoing universal trend in the global economy, consisting in the reduction of individual investments (owners) in business development with an increase

in the volume of borrowed funds and public resources including state and “priceless” ones [1; 12]. This is the most important prerequisite for the “socialization of production development solutions”, for the transition from management, based on the commercial effectiveness of the project, to the social effectiveness of business solutions.

Accounting for the “new reality” in the estimates of metallurgy

According to numerous estimates, system-wide changes are becoming the main factor influencing the role of individual economic industries. There are various methodological approaches to assess system-wide changes. Influenced by the research of J. Forrester and the report of the Club of Rome since the 1970s, doubts about the social effectiveness of economic growth have intensified, new approaches to assessing social development have emerged [13; 14]. They increased scientific interest, which is typical for making forecasts [15; 16].

In the history of mankind, social guidelines have repeatedly determined the processes of world development translating the social ideas to the microeconomic level. The production dynamics is increasingly influenced by behavioral and political factors. The influence of social processes on certain types of activities also has its own specifics, and it should be taken into account when forecasting the situation in metallurgy [17]. It is necessary to use a number of provisions that describe the system of interaction between society and individual [18]. According to these provisions, *the economy does not strive for market equilibrium; rather, it strives to achieve the established goals of social development*. It is necessary to take into account that the leverage resources (scientific, investment) in the industry is determined by its demand in multi-level economy [19].

The most significant social priorities for metallurgy, which are known from history [20; 21], are still relevant today.

We should remember that the most important public value is security, and metal played an important role in ensuring it. This defined metal production as the strategic output with limited access to this resource in many countries of the world. Currently, relatively small volumes of metal products (less than 3% of output) are used for defense needs, but they are of fundamental importance for ensuring the quality of economic growth. The military-industrial complex (MIC) demands high-quality materials (which account for over 60% of its consumption). By the share of special steels in the total metal output (less than 1%), Russia is significantly inferior to the world leaders (over 3.5% in the USA, Japan). Russia continues developing materials with special properties, which in the future can be manufactured for wide use, primarily to become the basis for increasing the competitiveness of civilian products [22]. If business does not ensure the “quality” of metal products, then this will be a problem not for business, but for the country as a whole.

Metallurgy has played and continues to play an important role in the industrial development of vast territories, associated with exploitation of deposits, creation of social and industrial infrastructure (railways), and formation of the country’s metallurgical potential [21]. Currently, on this basis, processes are underway in the Arctic and the Far East. New industrial regions continue to emerge in many countries of the world. In the 2000s, the world’s largest iron ore deposits were discovered in Afghanistan and Pakistan. Metallurgy centers are being formed in India, Iran, and Southeast Asian countries. The result of the growth in demand for ore and metal in the 2000s was a threefold increase in the transshipment of goods, destined for metallurgy, the expansion of maritime communications in Africa and Latin America.

Strengthening the state and increasing the requirements for economic returns from the resources under its control determine the specifics

of the organization of the metallurgical business. On this basis, various social tasks are solved. For many years, Australia, Canada, Norway, Sweden have been purposefully using the revenues of industries related to environmental management (metallurgy, fuel and energy complex) for carrying-out social programs. There is an example of Saudi Arabia and other Middle Eastern countries in addressing issues of raising living standards, based on natural rents, as well as the experience of the Netherlands (“Dutch disease”), the Caribbean countries and numerous examples of ineffective government policies, accompanied by the rejection of royalties, rental income [23].

The importance of government influence on production factors, used in metallurgy, pricing environment of global markets should be considered by their social implications. The success of metallurgy in South Korea, Japan and a number of other Southeast Asian countries was determined not by the companies’ income, but by social progress in these states, the creation of advanced metalworking industry, high-quality workplaces in the metal turnover system. Thus, both in the historical past and at the present time, the importance of social factors and state policy in relation to the metallurgical production of the leading world countries is no less important than scientific, technological or economic factors.

Russian experience of social accents in the metallurgy development: back lessons

The history tells us that ignoring the social aspect of production activities can be costly to business. In Russia, representatives of the metallurgical business should remember the fate of N. Demidov and many other entrepreneurs. Traditional economic leaders who derive income from nature (environmental costs that are shifted to the future) and people (social costs) may be limited by society in development, regardless of the production profitability rate. Russian metallurgy can distinguish three illustrative plots of the inconsistency of economic and social goals.

First, since the time of Peter I, the issue of the effectiveness of state-owned and private metallurgy has been discussed [21]. In his note, revelator Gerasim Rayevsky demanded to take away the metallurgical plants from the “exploiter”, to establish a state monopoly. “To determine the price for every iron of the national treasury and establish a sale of the treasury in the image of how salt is sold ... so that this multiple state interest is not stolen by peasant hands” [21, p. 458]. The source of income (“from which manufacturers get great wealth and self-interest”) was the resources, provided by the state to business (deposits, loans, “assigned villages”), with a low interest of business community in technological development. Stating the high economic efficiency of private business, about 300% profitability for key types of metal products (“two multiplying interests are stolen in vain”), the negative social consequences of the current situation on the metal market were indicated, primarily the damage to the achievement of state development goals for which metal was purchased. The high cost of the tool led to the problems in agriculture (“... no last bean can do without iron and especially on the above-described iron (*note – high-quality*) the greatest expense there, as people are low-money...” [21, p. 456], and eventually – to the problems with food. In one way or another, numerous state commissions came to similar conclusions regarding metallurgy and the metal market (on the problems of armaments in 1812, on the problems of infrastructure development during the Crimean War, the commission on the privatization of state-owned factories under the leadership of D.I. Mendeleev, etc.).

Second, F.E. Dzerzhinsky stated that during the transition to the system of state management of processes in the metal market of the 1920s, metallurgical companies, organized by the government (Convention (Prodamet), Uralmet, Yugostal and other syndicates), set prices for metal products 2–3 times higher than imported analogues, motivating this with economic objectives [24]. “The

issue of fuel and metal prices should be raised in its entirety as a priority issue of our economy. ... This (*note – convention*) is not a state authority of cheapening and increasing mass production, but the authority of inflating prices, ... has its logic – in the long term – the death of workers’ state” [24, p. 411]. He demanded a clear distinction between “public interests and the interests of state structures, designed to manage metallurgical production”. “The policy of our metal industry is to limit the sale of its products to population and impose them on the state, and thanks to this policy, the metal industry finds itself in a hopeless contradiction: population does not buy because it is too expensive, the state cannot order so much, as the population is too poor to give the state funds for this” [24, p. 406]. The relevance of the issues of the costs validity carried out by state-controlled enterprises and the pricing policy maintained throughout the planned economy. Numerous political and judicial decisions against the management of enterprises and authorized state bodies (the State Committee on Prices of the USSR, price departments of ministries) could not stop the price rising of metal products, affect the efficiency of production. The following thesis of 1923 is also relevant: “It is obvious that prices cannot be inflated further, but we spend time at scientific meetings in order to raise prices as a result” [24].

Third, the consequences of social phenomena are more significant for metallurgy than the results of economically sound management decisions. History shows that the creation of many metallurgical enterprises was considered economically unjustified. This applies to the development of the Kursk Magnetic Anomaly, metallurgy of Donbass, polar metallurgy. At the same time, economically sound solutions have not been implemented (the Far Eastern metallurgical base, the industry of intersectoral industries, etc.). There is a question about the reasons for stopping projects for the development of metallurgical bases in the USSR.

In the 1960s and 1970s, numerous projects were developed, there was an investment base, and unsatisfied demand for metal [25]. And suddenly a political decision to switch to intensive methods of economic development stops well-functioning model of sectoral development⁶. Undoubtedly, Russia’s modern metallurgy is the result of socio-political, and not “market” processes of the 1990s.

It is important to understand that economic actions determine the level of the company’s current profit (earned on the commodity market), and the social attitude to business determines its value (on the stock market). These are phenomena of fundamentally different scales. As illustrative examples, we can highlight the plots of recent years. V.V. Putin’s proposal to “send a doctor” (July 2008)⁷, A.R. Belousov’s reproaches (2018, 2021) led to a decrease in the capitalization of companies by billions of dollars. We emphasize that the resulting budget overspending in 2021 for metal purchases was 2.2 times lower than additional tax revenues from metallurgical companies⁸. Traditional economic arguments about the growth of profits and tax payments turned out to be less significant for the capital market than conditional social costs.

The social aspect of managing the processes of metallurgy development

Positive growth, as a rule, is a consequence of social recognition of the results of metallurgy (regardless of the truth or falsity of the assessments of citizens and authorities). In the 1950s and 1960s, it was characteristic of the entire world economy, where metallurgy was considered as one of the drivers of successful industrial development

⁶ On improving the quality of metal products and the efficiency of metal use: Resolution of the Central Committee of the CPSU and the USSR Council of Ministers. *Pravda*, June 8, 1980.

⁷ The “doctors” are no longer afraid. RBC. Available at: <https://www.rbc.ru/newspaper/2013/04/01/56c1b1a09a7947406ea09e13> (accessed: August 24, 2021).

⁸ The rise in steel prices cannot continue indefinitely. *Vedomosti*. Available at: <https://www.vedomosti.ru/business/characters/2021/06/06/873116-tsen-stal> (accessed: August 24, 2021).

Table 2. The most significant changes in the operating conditions of metallurgy

Type of social requirements	Probable business strategy	Current business activities
Climate and other obligations under interstate agreements	Increase in unproductive business expenses and their reflection in product prices	Investments in solving tasks, related to bringing production to established standards and monitoring their implementation
Environmental protection	Formation of a system of integrated waste disposal within the framework of the “zero waste” concept for the resources of state programs	Environmental protection costs of current and capital nature
Quality of workplaces	Bringing asset quality to the parameters of world leaders, labor productivity growth	Investments in the creation of the production apparatus, labor capital ratio
Social responsibility	Control over clusters with a dominant role of metallurgy. Social payments and business participation in the development of the region’s infrastructure	Participation in the formation of public capital, non-production facilities
Source: own compilation.		

of the country [8]. In the 2000s, there is a process of replenishing basic social values with a new set of benefits. They move from a system of moral preferences to the rank of social requirements established by the international community, which acquire a global character [2; 11]. Climate, ecology, human rights, and qualitative changes in the ideas of decent living standards act as conditions for sectoral development⁹. Gradually, under the influence of world practice, system-wide changes acquire a specific form of impact on industries’ development through the formation of special operating regimes, the introduction of tax and customs payments, and the use of sanctions restrictions. The established provisions have quite specific consequences for commodity markets and industries’ development: first of all, the cost of attracting resources to develop production depends on the social conditions in the country (region) (*Tab. 2*). In fact, business is required to participate in the reproduction of public resources (rational attitude to those that costs nothing).

The paradox of modern construction of the global economy lies in the fact that with a relatively stable situation in the world with traditional factors

of production (capital, labor, production and management technologies), specific changes in economic conditions are observed in each country [1]. They are determined by the ratio of public and individual costs of doing business and the distribution of the results obtained for the reproduction of production and system-wide resources. As an example, the situation in Russia is indicative, when it is profitable to produce metal, but it is unprofitable to develop metallurgical production. Current (individual) production costs in Russia are significantly lower than abroad (primarily in terms of wages), which ensures high profitability of metal production. There are advantages in comparison with the working conditions of other industries. For instance, the tax burden on metal production in Russia is 2.5 times lower than in the field of metalworking. The situation with the availability of public resources for business organization is fundamentally different: compared to the EU and the USA, metallurgical companies in the Russian Federation have to invest 7–8 times more in the development of non-core assets and non-production sector when implementing investment projects. This is reflected in the expected return on capital and priorities of investments in business development. Business prefers to invest in those countries that have public resources (USA, EU countries, China, etc.).

⁹ On the Agenda. The Davos Agenda 2021. *World Economic Forum*. Available at: <https://www.weforum.org/agenda/archive/davosagenda2021> (accessed: August 24, 2021).

Flows of labor resources and capital characterize the prospects for changing the situation in the country reflecting society's ideas about the value of certain types of economic activity [1]. The observed trends indicate the issues of metallurgy in the Russian Federation:

1. In the period from 2000 to 2020, which is estimated as favorable for metallurgy, more than 400 thousand workers left the industry (over 22%). The rate of employee retirement tends to increase. If in the 2000s the industry's restructuring led to reduction in non-core assets of enterprises and creation of new businesses based on them, then in the 2010s there was production modernization, accompanied by labor saving. The problem is that metallurgy could not offer new attractive workplaces.

2. The investments rate in metallurgy in the late 2010s was 1.5 times lower than in 2008¹⁰. The dramatic lack of growth in investments in seemingly highly profitable production adds to the accelerated growth of profits and depreciation charges at enterprises observed during this period (2012–2020). The increase in the own investment resource of metallurgical companies by more than 1 trillion rubles in 2017–2020 was used for investments in production development by less than 20%.

3. The situation for making decisions on development is aggravated by the social requirements of the state to the metallurgical business, their inconsistency in 1990–2000. To date, it is difficult to understand what the authorities mean, pointing to the need for socially responsible business behavior [26]. In most cases, it requires the business not to do what it does itself: do not be greedy, do not take money abroad, develop social infrastructure, etc. Gradually, the requirements of society to business are being concretized, in addition to the issues of earning income, questions

about their effective use in the country's interests are increasingly being raised [27; 28]. Public expectations also influence the authorities' actions forming a substantive social policy.

A modern entrepreneur realizes that social costs are not only expenses, but also a source of potential business income in the form of access to limited and preferential resources, a way to increase the company's capitalization. When assessing the effectiveness of investments made, especially non-production purposes, we should take into account that the owner of the metallurgical business has an economic interest in close relationship with the maintenance of social status [29; 30]. The socially oriented development of metallurgy can be judged by many phenomena of social life that are not directly related to metal production. The competition of metallurgical companies on sports grounds is no less acute than in the metal market. Business leaders take an active part in political and social movements, in the formation of civil society institutions. The restoration and strengthening of business ties with the scientific and educational sphere became especially noticeable in the 2010s. The formation of objects of "white" metallurgy, "intellectual production" is not just a stage of technological development, but a response to social challenges. Social expenditures are increasing (from 0.5% in 2005 to 2.5% in 2016), but their scale is significantly inferior to the expenditures rate of Western companies (over 15% of total costs).

The motives of behavior and the logic of their implementation play a key role in considering the social aspect of metallurgy development. The main ones for the foreseeable future remain the business targets, approved or rejected by the public, which is confirmed by the Russian and world practice of property redistribution in the 1990s–2000s [31]. The enterprises' owners face the task of preserving and multiplying property which determines their behavior. We emphasize that there are not so many ways to solve it. Within the framework of the

¹⁰ Unified Interdepartmental Statistical Information System. Available at: <https://www.fedstat.ru/> (accessed: August 01, 2021).

traditional approach, the emphasis is on extracting profit and investing it through an investment mechanism. As known, the social approach condemns the exploitation of people and assumes an active struggle against “superprofits” [10; 11; 18]. Unlike the previous period, when the struggle between entrepreneurs was for the increase of individual incomes, in the future a struggle for access to public capital (social benefits and state funds) is expected. In practice, solutions are being implemented that are quite controversial from economic standpoint, but bring obvious benefits to business (there is the success of Zuckerberg’s “free” Facebook, and there is I. Mask’s unprofitable business, which gives an increase in capitalization). The capital market provides an assessment of the effectiveness of the company’s social development. There is a public recognition of the validity of investments and social expenditures.

Prospective tasks and guidelines

In the forecast period, changes in the company will also lead to changes in certain industries. It is clear that the solution of many social problems is seen as “take away and divide” or “borrow” postponing the decision for the future. Experience proves that for some reason it is impossible to

overcome poverty without metal, to raise living standards (people also lived in the Stone Age, but the progress was ensured by the Copper, Bronze and Iron Ages) [20]. The industry specifics and the capabilities of existing enterprises to adapt to the new requirements of society determine a set of tactical and strategic tasks, solved by metallurgy. Traditional social policy at the enterprise level addresses specific issues of employees and issues of providing production with labor resources. For the success of business in modern conditions, this is no longer enough. Advertising of new materials and training in their use become important factors in changing the structure of metal consumption.

Fundamental for the current stage of industry forecasting is the fact that previously social requirements determined the *product’s nature (useful – harmful)*, and in the 2020s and in the future they will determine the production nature of almost any product. There is a positive experience of the 20th century that shows the victory of social values over the economic benefits of business. Modern production has managed to adapt to the rejection of the exploitation of child labor, compliance with labor contracts, and environmental requirements.

Table 3. Social guidelines of industry development scenarios

Element of the social mechanism of sectoral development	Scenario 1 (business-oriented)	Scenario 2 (State-paternalistic)	Scenario 3 (radical social transformations)
Current task	Transformation of public costs into individual entrepreneurial income	Building up public resources by the state at the expense of funds, received from business	Formation of social environment based on the results obtained by business and population
Solution	Management based on general economic rules in the framework of business competition for public resources	Management of public resources based on the specialized institutions of social development	Management of the process of concentration of citizens’ capital and wealth at the regional level
Business participation in the country’s social development	Payments to the state and population within the framework of socio-fiscal burden on business	Active participation of business in the formation of public goods, transition from system of corporate resources to open access system within the regional social environment	Ensuring the efficient use of public resources when investing private funds
Indicators of development process	Business profit. Loss of public resources	State ownership scale. Business capitalization	Region’s wealth including public, human and private capital
Source: own compilation.			

In rapidly changing social conditions, it is quite difficult to assess possible medium-term economic benchmarks and formulate alternative options for the production and technological development of metallurgy. Taking into account the features of the formation of social guidelines by management entities and their impact on metallurgy, it is currently advisable to consider three vectors (scenarios) of sectoral development (*Tab. 3*).

1. *Business-oriented scenario* should be considered as negative for metallurgy. It assumes to preserve the current logic of the Russian economic growth [16; 32]. Threats to the economy of business, engaged in the active gratuitous appropriation of public resources, are extremely specific. The return on capital at new facilities is an order of magnitude lower than at the existing production (12 times in the 2000s and 17 times in the 2020s). Over the previous years, the public resources, required for the industry's development and used in metallurgy, have significantly declined. Mineral reserves were transferred to private companies for development, which began to bear the costs of their reproduction and involvement in operation. Metallurgical companies overcome the restrictions on transport infrastructure by actively participating in the construction of ports, the acquisition of a car fleet. In many cases, when creating new production facilities, companies are forced to create their own social infrastructure. This type of "semi-natural" development has obvious economic limitations that did not allow the Russian metallurgy to achieve output growth in exceptionally favorable environment in the global metal market of the 2000s–2020s. The idea that everyone can enrich themselves at the expense of public good is gradually losing appeal among the population [28; 29; 30].

As the resource base and effective areas of metal use decrease, the output of metal products will also decrease (by 10–15% by 2030). In metallurgy, the release of personnel will continue at an even higher rate than in the 1990s crisis (over 25%). Against

the background of increased labor productivity at metallurgical enterprises, public labor productivity in the region of their location will decline. Social problems will worsen in the areas where the city-forming metallurgical enterprises with limited public capital are located, primarily in the Urals and Siberia.

2. The intensification of economic activity of state authorities seems quite likely in the medium term [12; 16; 28]. The basis of the *forecast scenario (state-paternalistic)* is formed by the mechanism of economic development based on state management of resources, formation of a new logic of managerial decision-making (in the interests of strengthening the country). Such scenario has been successfully implemented in Japan, the countries of Southeast Asia during the implementation of projects for the integrated development of large regional systems in the USA, Canada, China, India and other countries. The difficulties and problems arising during its implementation are well known from the Russian practice of the 2000s–2020s. World experience shows that certain social conditions and strategic challenges are necessary for the successful implementation of the scenario [11; 12].

The growth of metal production by 2030 on the basis of increased government influence on the metal market may be about 5–10%. As possible result of state efforts, it is necessary to consider the creation of the Far Eastern metallurgical base, the expansion of activities for the production of the end metal products, reaching a new level of product quality using scientific and other public resources that Russia has [15]. The social effectiveness of this scenario has a deferred nature, as for its implementation period, the state, mobilizing resources, is forced to introduce special regimes for managing human resources and business behavior (capital).

3. System-wide changes in the global economy help to consider *radically new scenarios for the development* of not only metallurgy, but also

Russia as a whole. This scenario cannot be lowered “from above”, it is formed by the whole society in conditions of increasing contradictions of interests between the population, political and market authorities [15; 27; 32]. After the conflict between economic and social goals typical of the 20th century, there is a search for their coordination, which seems to be a difficult but solvable task. Despite the presence of certain prerequisites for changes on the part of the information environment, business is not going to cede its power over society. It needs a new motivation system.

Within the framework of social logic, businessmen, as well as other citizens, will be driven by ideas of self-realization, and this requires resources. Business uses its private resources to attract employees and public resources that are at the disposal of the state (fundamental developments, infrastructure, personnel training system, etc.). Fundamental changes are expected in the labor market [16; 28]. This is not only a consequence of the idea of basic income, new views on the reproduction of human capital, but also citizens’ motivations. Specially organized territories attract people no less than the current stability. The social package attracts a person no less than the level of remuneration. Supplementing wages with social benefits leads to the formation of a qualitatively new level of not just income, but also person’s living standards. This is not only the Soviet experience, but also global practice [17].

The forecasted output of metal products due to the growth of resources’ volume, involved in the industry, will grow slightly (by about 10% by 2030). The main focus will be on qualitative changes, an increase in the share of high-grade products in the industrial output (from 30 to 75–80% by 2030). Due to structural changes under the scenario of radical social transformations, the total volume of industrial production at comparable prices will increase by 3–4 times by 2030. If social criteria are given

priority in the country’s economic development system, then a situation of “unlimited demand” will arise in metallurgy, and business will face the task of effectively satisfying it. The experience shows that it is quite difficult to solve this problem [8; 34]. People will be needed, and their involvement in production will form a trend for positive social changes in the country, which will be the answer to social challenges.

Forecasts should provide answers to the issues facing the economy, and social challenges are currently the most urgent of them. There is no reason to believe that a few percent increase in GDP and creation of macroeconomic conditions will significantly change the situation in the social sphere.

Historical experience proves that as the production and consumption of metal increased in the country, society got rid of problems with poverty. Unfortunately, those authorized to fight poverty in Russia do not think about how much metal is required for this. In the current management system, even if the answer is known and there are appropriate resources, questions arise with the solution of social problems. The logic of modern economic development and forecasts, based on it, indicate a possible aggravation of social problems entailing additional restrictions in metallurgy development.

Metallurgy, including Russian one, is gradually losing its connection with social processes in the country. At a time when it is increasingly necessary to hear about the lack of prospects to develop metallurgical production, with references to the experience of the USA, the EU, we should understand that this is a consequence of certain economic conditions and the logic of decision-making, determined by them. People create conditions, and people are able to change them, which determines the possibilities of forming social development guidelines and mechanisms for achieving them.

Removing economic restrictions on management decisions, social guidelines help industries to fully realize their capabilities to meet the needs of society not only in goods, but also in the social conditions of development and realization of citizens' abilities [34].

The forecast, based on estimates of the relationship between public resources and individual business resources, indicates the attractiveness of the socially-oriented scenario in comparison with business-oriented or state-paternalistic scenarios. The socially-oriented scenario ensures high dynamics of metal production, growth of business capitalization and living standards in the country.

Conclusion

The social success of metallurgical companies will lead to changing the industry's positions in the labor and capital markets. The involvement of public resources in the industry indicates its socio-political positions in the economy and is the result of rejection or approval of the activities of enterprises.

Russian metallurgy is undergoing socialization. After the stage of the 1990s, associated with "the dumping of social infrastructure from the balance sheet", significant funds are again invested in social projects. There is still a long way to go to the level achieved in the EU countries. Relative parity exists in terms of spending on social infrastructure, there is a noticeable lag in terms of wages by an order of magnitude, in terms of spending on retraining, improving the quality of jobs per employee – tens of times, hundreds of times – in terms of contacts with the scientific sphere. In the forecast period, the growth of requirements for changing social conditions in the country implies receiving an adequate response from business.

Economic processes in Russia are gradually acquiring social content, and social processes are gaining an economic basis. For current decisions in the industries, the parameters of social efficiency are important, provided that the business has an economic effect when working for the goals set by society.

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Assessing the Impact of Innovation and Investment Activity on the Formation of an Export-Oriented Agricultural Economy*



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Abstract. The issue concerning the formation of an export-oriented agricultural economy is associated with the need to assess its innovation and investment activity and analyze the quality of state policy to stimulate innovation and high technology products in agricultural production. High differentiation of Russian regions by natural and climatic conditions and the level of resource provision are factors that hinder the formation of new export positions, which predetermines the need to improve state investment policy, considering regional differences. The purpose of this study is to identify the dependence of the export level of agricultural products on the level of innovation and investment activity, the development of recommendations to improve innovation and investment activity of territorial and sectoral agricultural systems. We put forward the following hypothesis: one of the most important factors in increasing the volume of agricultural products exports of the region is the level of innovation and investment activity. As a methodological basis we use theoretical approaches of foreign and Russian authors to assessing the impact of innovation and investment processes on the increase of export potential, as well as the formation of balanced export-oriented agricultural systems in the territorial and sectoral sections. We develop a model estimating the relationship between investment in fixed capital in agriculture, gross output of the industry, and exports of agricultural products using methods of multivariate statistical analysis. We assessed the dynamics of regional innovation and investment development and compared the selected typological groups of Russian regions by their production and export efficiency, the resources used and the results achieved. The novelty and significance of the developed model lies in the possibility of its application for diagnostics and monitoring of the state of territorial sectoral and regional innovation and investment agrosystems. For each type of region we proposed differentiated strategies of state regulation aimed at overcoming the limitations of low innovation and investment activity in the formation of export-oriented agricultural economy. The results of the study are of practical value for the development and implementation of targeted mechanisms and tools to improve the efficiency of innovation and investment activities in order to ensure the leading position of the regions in exports of agricultural products.

Key words: innovation and investment activity, agricultural economy, export, modeling, principal components analysis, typology of regions, state support, territorial and sectoral approach.

Introduction

It is possible to enhance innovation development of the agricultural sector, increase the efficiency of agricultural production in the transition to an export-oriented agricultural economy is possible through the development of incentive mechanisms for innovation and investment activity. With the transition to digital, intelligent and robotic technologies, it becomes relevant to find new models of innovation policy, ensuring the effectiveness of the development of the innovation system, the effective organization of the dissemination and implementation of innovation [1]. According to the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw

Materials and Foodstuffs (as amended on March 31, 2020)¹ and Scientific and Technological Development of the Russian Federation approved by Government Decree no. 642, dated December 1, 2016², problems of insufficient coordination of research institutes with economic sectors prevent

¹ “On Amendments to the State Program of Agricultural Development and Regulation of Markets of Agricultural Products, Raw Materials and Food”: Government Decree no. 375, dated March 31, 2020. Available at: <https://base.garant.ru/73841082/> (accessed: November 12, 2020).

² “On the Strategy for Scientific and Technological Development of the Russian Federation”: Presidential Decree no. 642, dated December 1, 2016 (ed. March 15, 2021). Available at: http://www.consultant.ru/document/cons_doc_LAW_207967/ (accessed: March 20, 2021).

the scientific and technological development of Russia. The increase in innovation reproduction efficiency in agriculture and agroindustrial complex as a whole is possible subject to congruence of interests of agribusiness, science and the state, taking into account diagnostics of the sectors' need for targeted innovation, scientific-intellectual, financial and informational support, balanced distribution of resources, knowledge, information, competences and technologies at all stages of the innovation process [2].

The purpose of the study is to identify the impact of the level of innovation and investment activity on the export of agricultural products and to develop differentiated strategies of state regulation of innovation and investment activity of territorial and sectoral agricultural systems.

Degree of the problem development

The effective management of innovation processes in the agro-industrial complex (AIC) requires the elaboration of its balanced development directions, considering spatial and strategic approaches at the federal, territorial and sectoral levels. The increase in innovation and investment activity and the formation of balanced agro-innovation systems (AIS) at the territorial and sectoral levels is based on the concept of innovation systems. The dominant role in creating the model of export-oriented agrarian economy belongs to building relationships between science, state support institutions, agribusiness and innovation formations within the framework of implementation of innovation agrarian policy [3]. There are different interpretations of the term AIS [4; 5; 6]. Relationships between AIS actors are transformed in the process of its formation, reaching the necessary level of balance [7–12]. The formation of territorial AIS is influenced by economic, geographical, technological, social, regulatory and institutional factors. One of the factors increasing innovation and investment activity in AIC is the intensity of connections between

individual elements of innovation systems and actors [13]. The transformation of socio-economic processes is reflected in various concepts: innovation clusters, triple helix [14] and quadruple helix of innovation [15; 16].

For assessing the level of innovation activity there are different approaches and methods that are applied abroad. Among them are European Innovation Scoreboard, Technology Achievement Index, Innovation Capacity Index, World Innovation Index (GII BCG), World Innovative Index INSEAD (GII INSEAD), Global Innovation Factor Global Innovation Quotient. Internationally, the best-known and most widely used are the World Economic Forum ratings, the UNCTAD innovation capacity indices, the World Bank's assessment of the level of development of knowledge economies, and the European ratings. The advantage of these methodologies is the possibility to assess both resources and results of innovation development on the basis of statistical data available in the regional and sectoral context. In Russian studies, the most famous are the ratings of RF constituent entities of the Higher School of Economics, as well as the ratings of innovation development of regions of the Association of Innovative Regions of Russia³. At the same time, the quality of innovation policy became the key to the success of breakthrough technologies. Assessment of functions of AIS actors and development of methods of monitoring, comprehensive assessment of efficiency and forecasting of regional innovation policy are of paramount importance [17; 18].

Key indicators to assess the innovation development level, taking into account the inter-regional differentiation factor, determining the pace of innovation development of the Russian

³ Association of Innovative Regions of Russia (2018). Innovative regions of Russia ranking. Available at: <http://i-regions.org/reiting/rejting-innovatsionnogo-razvitiya> (accessed: April 13, 2020).

economy, are the volume of physical production of gross agricultural output, the amount of public investment in the industry, labor productivity, capital-labor ratio, composition and the number of researchers in agriculture, the level of personal income. According to Yu.P. Bondarenko, the level of interregional differentiation in agriculture is influenced by factors of general and sectoral action. The factors of general, or external, impact include the rate of sustainable socio-economic development of regions, the level of their investment activity, the degree of provision and development of resource potential. Among the factors of intrasectoral action it is advisable to consider the level of innovation activity of a particular sector, the level of expenditure on technological innovation required to achieve the planned production performance [19]. Based on the assessment of factors affecting innovation activity, we propose mechanisms to improve investment policy [20].

In the study we make a hypothesis: the level of innovation and investment activity is one of the most important factors in increasing the volume of exports of agricultural products in the region.

In the global economics literature, when studying the connection between innovation and export, both the influence of enterprises entering the international market on their innovation activity and the influence of innovation-active companies on the expansion of export potential are studied. The research comes down to two fundamental theories describing the higher innovation activity of exporting companies [21]. C.L Leonidas in his works proves that the expansion of the market and export positions is an incentive for innovation, growth of production efficiency [22]. From another point of view, the innovative position of the firm determines the level of relationship between exports and productivity. This hypothesis is confirmed at the theoretical and empirical levels by W. Cassiman, E. Golovko, E. Martinez-Ros [23].

According to the self-selection hypothesis, innovatively active enterprises have higher profitability, which allows them covering the costs associated with entering foreign markets. In this key, innovation is the driving force for increasing productivity, reducing costs, increasing product quality, contributing to the entry of the enterprise to export positions [24].

The learning-by-exporting hypothesis orientation assumes that the enterprises focused on export, adopt the positive foreign experience [25] of introduction and distribution of organizational, technological, marketing innovations in manufacture for effective business and maintenance of leading positions in the market [26].

Having gained export positions, enterprises acquire new perspectives and opportunities to implement innovations and high technology products in manufacturing processes, thus creating a positive learning effect from international cooperation. According to this view, exporting acts as a reason for transferring positive foreign experience into the business processes of enterprises. The self-selection hypothesis has a significant number of empirical confirmations in contrast to the learning-by-exporting hypothesis [27–30]. At the same time, studies proving that the two hypotheses are complementary and do not exclude the effect of each other. The increase in the competitiveness of enterprises due to the introduction of innovations causes the growth of productivity due to the export effect. In turn, export activity contributes to productivity growth even taking into account the self-selection effect [31; 32].

We share the position of N.V. Linder, E.V. Arsenova [33] concerning the substantiation of mutual influence of exports and innovations, in which the investment decision in the field of export policy formation becomes a precondition and a condition for the investment decision in the field of innovation development, and vice

versa. The effectiveness of the interaction of these processes is achieved due to the fact that both exports and innovations serve as potential drivers of new knowledge. Moreover, due to the potential interconnection of product and process innovations, the decision to produce an innovation precedes the decision to create an export-oriented development model. Further, revenues from export activities allow the company to implement more expensive process technological innovations aimed at increasing productivity and efficiency of manufacturing processes.

As a result of the complementarity of exports and innovations, the following gradation of enterprises is formed: the most effective enterprises are those that simultaneously participate in export and innovation activities, they are followed by enterprises engaged in either export or innovation activities, then those that do not participate in either export or innovation activities [34].

Despite the relevance and significance of the presented topic, comprehensive studies aimed at analyzing the dependence of innovation, productivity and exports are currently insufficient. Kozlov and Wilhelmsson tested the self-selection effect on the data of customs statistics [35]; De Rosa's works substantiate the importance of studying the previous experience of work in foreign markets [36]. Yu. Gorodnichenko proved on the basis of data from surveys of firms in 27 transition economies (BEEPS), including Russia, that globalization enhances the level of innovation and investment activity of enterprises [37]. In the works of V.V. Golikova, K.R. Gonchar, B.V. Kuznetsova test hypotheses about innovation incentives formed when firms enter foreign markets, based on panel data obtained in the course of surveys of manufacturing industry enterprises, conducted by the Higher School of Economics [38].

According to M.Yu. Arkhipova, innovation activity (expressed both in the cost of research and

development, and in the novelty of products, patents received, etc.) allows enterprises to expand their sphere of influence, to move from local to national and even international sales market. At the territorial and sectoral levels, the conclusion is confirmed that the most innovatively active enterprises, capable of supplying competitive products to markets and overcoming the costs of entering new global markets, become exporters [39]. The impact of digitalization processes on the development of technological exports was also considered [40].

The influence of innovation and investment activity on the dynamics of agricultural exports and the adjustment of public policy directions in regions of different types, considering the achieved level of innovation development, is not enough studied, which predetermined the choice of the topic of our work.

Harmonization of the policy at the federal and regional levels is the key to the implementation of the set task, while the mechanism of state support of innovative reproduction in the countryside should be built in such a way that it directly stimulates the procedure of changing technological modes. All of the above shows that there is the need to improve investment policy: the main direction should be investment promotion in priority sub-sectors of agriculture.

In this regard, it is relevant to develop theoretical and methodological approaches to the study of the impact of innovation and investment activities on the formation of export-oriented agricultural systems at the regional and sectoral management levels; evaluation and forecast tools to diagnose the relationship between investment in fixed capital in agriculture, gross output industry and export of agricultural products based on the classification of Russian regions by factors that aggregate these characteristics; directions for improving the state innovation and investment policy in the agricultural sector of the economy for different types of clusters.

Materials and methods

The article is a logical extension of research on the topic of innovation and investment development and the formation of an export-oriented economy. In previous studies, we searched for relevant indicators and effective tools for modeling the impact of innovation and investment development on the increase in production and export potential using the concept of open innovation at the regional level.

Continuation on the topics indicated in this work on the basis of synthesis of conceptual provisions of foreign and Russian theories of innovation and investment impact on export, we put forward the following hypothesis: the level of innovation and investment activity is one of the most important factors contributing to increasing the exports of agricultural products of the region.

We carried out an analysis of the impact of investment on exports in the territorial context, as well as diagnostics and monitoring of the concentration of innovation and investment activity at the sectoral level.

As an information matrix for the study we used empirical agricultural data for the regions of Russia for 2018–2019, for which the analysis of the spatial structure of production, investment and export potential, costs and results of innovation activity was carried out.

Statistical methods of multidimensional classification of the constituent entities of the Russian Federation were used to account for regional differences in the level of investment, production and export potential. The most widespread among them is the method of cluster analysis, the main feature of which is that the differences between the objects included in the selected group are insignificant, and the differences between the groups are significant.

The cluster analysis was conducted according to such indicators as export of food products and

agricultural raw materials, proportion of food and agricultural raw materials export in total export, gross agricultural output per 1 ha of agricultural land, investments in fixed capital aimed at agricultural development per 1,000 rubles of gross output, export of cereals and legumes, export of meat (including by-products) and meat products, thousand tons in slaughter weight, gross yield of grain (in weight after processing), production of livestock and poultry for slaughter (in slaughter weight).

As a result of the cluster analysis, we conducted a classification of Russian regions with the allocation of groups with a high degree of homogeneity according to the available set of indicators. The dimensionality of the feature space was reduced by the principal component method of factor analysis.

In the process of dimensionality reduction correlated variables are combined into new ones – generalized and uncorrelated, which explain most of their total variance. Formally, generalized variables are represented by linear combinations of the original normalized variables, the coefficients in front of which reflect factor loadings varying in the range from -1 to 1 and characterizing the strength of influence of a particular indicator on the main component. As a result, the feature space is compressed and its axes are orthogonalized; the consequence is an increase in the efficiency of the subsequent multivariate classification on these axes [41].

The obvious advantage of using Ward's hierarchical method with squared Euclidean distance is the possibility of achieving a fairly high homogeneity of clusters based on the construction of their step-by-step association tree. At the initial stage, each object is treated as a separate cluster, further the objects are sequentially combined based on the chosen proximity measure, until only one remains. The work of the algorithm is completed on

a given number of clusters, set by expert way. If the number of clusters or belonging of particular objects to particular clusters is known a priori, methods “with learning” are used, among which the k -means clustering stands out [42].

The statistical base of the study includes data on 69 regions and constituent entities of the Russian Federation, for which there was available information on all selected indicators. The calculations were performed using the SPSS statistical information processing and analysis package.

Research results

Factor analysis was used for the original variables $X_1...X_8$, which were distributed over 69 regions of Russia and normalized according to the standard procedure, leading to a zero mean and unit variance. As a result, three principal components were obtained, explaining 78.3% of the total variance. Due to the rotation of the space of principal components using the Varimax method, a clearer distribution of the factor loadings of the initial normalized indicators on the principal components was achieved. The resulting matrix of factor loadings makes it possible to unambiguously correlate the initial indicators with the principal components.

Factor loadings which are the highest in absolute value (above 0.5) are determined by the indicators explaining the content of the main components. The first principal component (PC1) explains 33.6% of the total variance and is formed by three absolute indicators with high factor loadings – X_1, X_5, X_7 and unidirectional dynamics. Export of food and raw materials is directly related to the production and export of grain, so PC1 can be characterized as “food and agricultural exports and its main factors”.

The second principal component (PC2) explains 30.2% of the total variance and includes three indicators with high factor loadings –

X_3, X_6, X_8 . The relative indicator of the value of gross agricultural output (per 1 hectare of agricultural land) has an indirect relationship with the absolute indicators of livestock and poultry production and export of meat products, so PC2 can be characterized as “efficiency of agricultural production and its main factors”.

The third principal component (PC3) explains 14.5% of the total variance and consists of two relative indicators – X_2, X_4 . Investment in agriculture (per 1,000 rubles of gross output) is directly related to the growth of the proportion of food exports. PC3 shows that investment in agriculture produces food exports: the higher the capital intensity of agricultural production, the higher the proportion of food exports. PC3 can be called “intensity of investment in agriculture and export of agricultural products”.

The average values of the principal components for each typological group are shown in *Table 1*.

The table shows that the first, second and fifth typological groups have the highest values of the principal components. It should be emphasized that PC3 acts as a leading differentiating feature in the formation of the second and third groups; PC1 reflects the high level of production and export of grain and export of raw materials, as well as export of raw materials and food of the fifth typological group.

The result of the classification by Ward’s method based on the three selected principal components was the formation of five typological groups of regions. One should note that the Belgorod Oblast (group 1), the Rostov Oblast and Krasnodar Krai (group 5) joined the general hierarchical classification tree during the last iteration. These regions differ significantly from the others in their high specialization in the production and export of meat (Belgorod Oblast) and grain (Rostov Oblast and Krasnodar Krai), which is confirmed by high values of PC2 and PC1.

Table 1. Average values of the principal components in the typological groups

	1	2	3	4	5
PC1	-0.213	-0.190	-0.299	-0.055	5.238
PC2	6.022	0.664	-0.358	-0.174	0.060
PC3	-0.962	1.568	0.403	-0.740	0.197

Source: own calculation.

The other regions form three typological groups – 2, 3, and 4, comprising 11, 21, and 34 constituent entities of the Russian Federation, respectively. The group compactness coefficient was determined as the sum of the squared Euclidean distances, calculated in the space of three principal components, between all pairs of regions included in the cluster, divided by the number of these pairs. As a result, the compactness of the third group was 0.91, the fourth was 1.11, and the second was 4.30. One should note the most compact third group, which includes two sets of regions united at one of the first steps of clustering. The second

group is the least compact due to the connection at one of the steps of rather isolated regions with significant features (Kamchatka Krai, Kaliningrad Oblast). The fourth group was also formed by combining two compact subgroups consisting of 28 and 6 constituent entities, the latter of which is characterized by high PC1 and PC2 values at one of the middle steps.

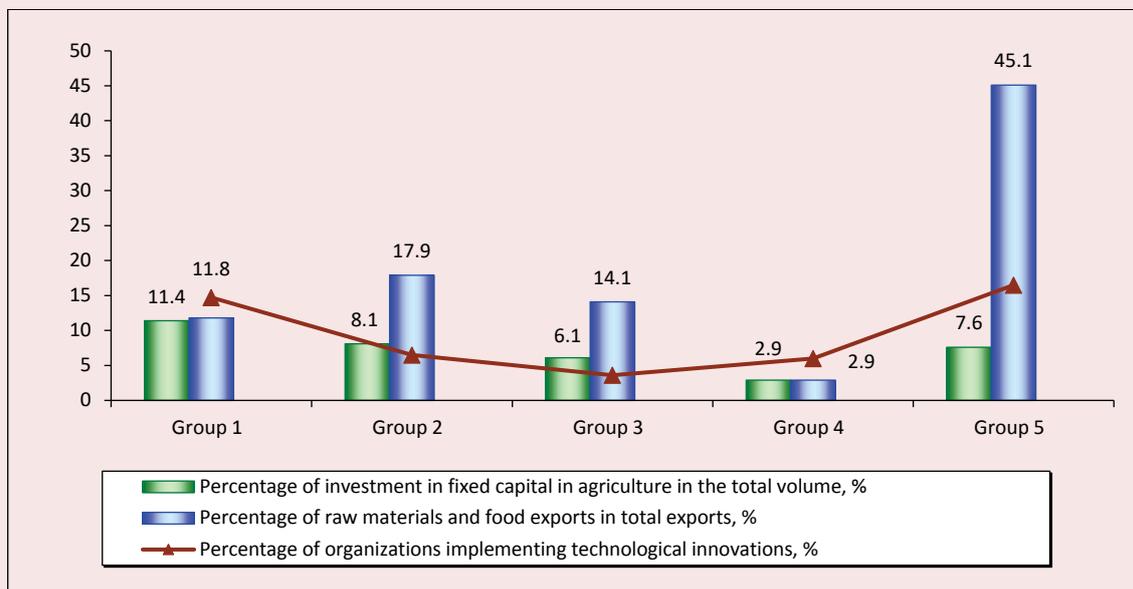
Calculations of statistical indicators characterizing the production, investment and export potential according to the current statistical data broken down by typological group are presented in *Table 2*.

Table 2. Characteristics of typological groups by the level of production, investment, and export potential (2019)

Indicator	Group 1 (Belgorod Oblast)	Group 2 (11 regions)	Group 3 (21 regions)	Group 4 (34 regions)	Group 5 (2 regions)
Gross yield of grain (weight after processing), thousand tons	3473.1	1705.3	740.1	1664.6	12992.0
Production of livestock and poultry for slaughter (slaughter weight), thousand tons	1705.2	230.1	75.2	138.8	296.3
Gross output of agriculture per 1 hectare of agricultural land, thousand rubles	140.1	58.9	29.9	20.4	56.5
Investments in fixed capital aimed at the development of agriculture, per 1,000 rubles of gross output, rubles	44.0	153.1	110.7	70.7	53.5
Export of food products and agricultural raw materials, million dollars	384.9	344.6	166.0	105.2	3537.0
Proportion of food and agricultural raw materials exports in total exports, %	11.8	17.9	14.1	2.9	45.1
Grain export of cereals and legumes (including export), thousand tons	389.6	819.0	310.7	679.5	17056.9
Export of meat (including by-products) and meat products (including abroad), thousand tons in slaughter weight	1285.6	299.0	64.2	91.0	163.2

Calculations based on: *Regions of Russia. Socio-Economic Indicators. Stat. Coll.*, 2020. Rosstat. Moscow, 2020. 1242 p.; EMISS of federal statistics. Available at: <https://www.fedstat.ru/indicator/58969>

Relationship between food exports and agricultural innovation and investment development of typology groups (2019)



Source: own calculation.

Discussion of the research results

A more detailed analysis of the indicators by typological groups reflects the multidirectional trends in the development of investment and export potential. The *Figure* shows the relationship between food exports and agricultural innovation and investment development.

One should note the absence of linear dependence between innovations, investments and export, which is especially noticeable in the first and the fifth groups. In the first group, the higher percentage of organizations carrying out technological innovations is combined with the level of investment corresponding to the scale of export. In the fifth group, on the contrary, the export potential exceeds the scale of investment and export.

In previous works the study of regional specifics of the provision of investment in fixed capital in agriculture, taking into account the specifics of innovation processes were carried out in the case of the Volga Federal District [43].

A more detailed study showed a significant degree of regional differentiation of production, investment-innovation and export potential in the highlighted typological groups. The first group, consisting of a single region – the Belgorod Oblast – is distinguished by higher indicators of efficiency of gross agricultural production, production and export of livestock products. In 2019, the Oblast ranked tenth in terms of investment in fixed capital in agriculture (11 688.9 million rubles). At the same time, the level of investment in fixed capital per unit of gross output in it is lower than in most regions of other groups – 44.0 rubles per 1,000 rubles (39th place out of 69 considered constituent entities of the Russian Federation). The situation of “underinvestment” can be explained by the effect of the scale of production: the Oblast ranks third in Russia in terms of gross agricultural output (265,693 million rubles), and investment is made at a lower rate compared to the volume of production. Based on the above, the Belgorod Oblast has high

production potential and an export-oriented livestock sector, but investment activity does not correspond to the growth of production volumes, although the processes of modernization of fixed capital are quite active (in 2019, the proportion of investment in machinery and equipment in the total volume of investments in reconstruction and modernization was equal to 41% with the average value for Russia being 17.2%). Consequently, the implementation of major investment projects in the direction of diversification of production and exports will require the allocation of additional financial resources [44].

The second typological group is characterized by the highest investment activity, as evidenced by the index of investment per unit of gross output – 153.1 rubles. In such regions as the Kaluga, Moscow, Bryansk, Kaliningrad and Voronezh oblasts, the value of this indicator exceeds the average value for the group. Favorable opportunities for investment are also confirmed by the high investment attractiveness of most regions of the group. The Penza and Voronezh oblasts are implementing major projects in the pork sub-sector. In the Kaluga and Moscow oblasts robotization processes in dairy breeding are actively implemented [45]. At the same time, attention should be paid to the lower production efficiency (58.9 rubles) in comparison with the Belgorod Oblast, although the export potential of grain and meat is quite significant. Thus, the analyzed group of regions has high investment potential and export-oriented production of grain and meat, although there are reserves for increasing production efficiency. The growth potential of grain and meat exports is confirmed by indicators of the intensity of interregional supplies, and the innovative dominance of exports is associated with the production of mainly food products with high added value.

The third typological group is characterized by low potential of grain and meat production and food exports, the point nature of investment, which limits the possibilities of balanced development: 5 of 21 regions account for about 60% of total investment in fixed capital. Low investment activity does not allow increasing the efficiency of agricultural production and ensuring leading positions in the segment of food export. Studies have established limited opportunities for exports of high-technology goods, despite the significant percentage of food and agricultural raw materials exports (14.1%), which is associated with significant interregional differentiation.

The regions of the most numerous fourth group are characterized by low investment potential, poor development of meat industry and an insignificant percentage of food exports. Compared to the regions of the third group, there is a slightly higher innovation component in the pork and food production sub-sectors and an insignificant percentage of food exports (2.9%). Interregional differentiation is most characteristic of grain production and export. For instance, Stavropol Krai is one of the top ten exporters of wheat, having a higher investment potential than the average for the group. Further development of the region's investment potential is connected with increasing the efficiency of the agrarian sector.

The fifth group, consisting of the Rostov Oblast and Krasnodar Krai, stands out for the highest export potential of raw materials and food, as well as the scale of grain production due to regional specialization. At the same time, the opportunities to improve production efficiency and strengthen investment activity have not yet been fully used, although the innovation potential of grain exports is quite high.

The specifics of the innovation development of Russia is determined by a significant unevenness of this process by regions, which can be further reduced as a result of diffusion of innovations from innovation centers to the regions of innovation periphery [46]. Due to the specifics of the Russian national innovation system – it is possible only with the implementation of an active state policy in the sphere of investment and innovation activity management, as well as with the increase in the number of private investors of innovation projects. However, in the coming decades a significant gap between the subjects – leaders of innovative development and the lagging regions will remain. The prevailing territorial approach in the modern innovation discourse actualizes the formation and implementation of differentiated types of regional innovation policy, adequately considering the available resources, their strengths and weaknesses, as well as the priorities of regional development with different measures of state support and ways of development of innovation competences. Sufficiently successful European experience in the development and implementation of regional innovation strategies in the framework of regional innovation policy allows distinguishing the following stages: analysis of innovation and investment activity at the territorial and sectoral levels, coordination of the main stakeholders of agrosystems, planning and coordination of their activities, monitoring and performance assessment, scientific and technological forecast, substantiation of priority needs, development of organizational, economic and financial mechanisms of state support.

The results of the empirical study show the presence of significant imbalances in the level of innovation and investment activity at the inter-regional and sectoral levels, which limits the scale of

food exports. In order to eliminate disproportions, methodological approaches aimed to improve the mechanisms of state regulation of spatial innovation and investment development were developed. The developed typology of regions allows distinguishing differentiated strategies of state regulation for each group of regions, aimed at increasing innovation and investment activity in the process of export-oriented agricultural economy formation.

The Belgorod Oblast is a technological leader in the production of pork and food (the percentage of shipped innovative goods in pig breeding and food production is 11.2% and 17.5%, respectively), which predetermines the possibility of exporting products with a high degree of processing. Unlike other typological groups, the scale of meat production makes it possible to form the region's export positions, the expansion of which should be expected in the near future, subject to state support. Given the high innovation activity in the production of certain types of livestock products and processing, with regard to this region it is advisable to use the strategy of maintaining technological leadership and expanding exports of livestock products with high value added, the strategy of increasing investment activity by promoting the development and implementation of investment projects using digital economy tools.

The second typological group has high investment activity and export-oriented production of grain and meat, although the innovation activity in the production of certain types of products is of a point nature, limiting the opportunities to increase efficiency. In this regard, it is recommended to use multidirectional strategies: the strategy to stimulate investment activity in the industries engaged in deep processing of raw materials, and the strategy to increase innovation activity in grain production.

The third typological group is characterized by low innovation and investment activity and limited food export opportunities. Localization of investment in a few regions acts as one of the main constraints to food exports, including the supply of high technology goods. Based on the above, the increase in innovation and investment activity can be achieved as a result of the recommended strategy of economic growth in grain and meat production, aimed at creating favorable conditions for improving the use of productive capacity through the implementation of new projects, including infrastructure; strategy to encourage the flow of knowledge to enhance the diffusion and use of innovation.

The fourth typological group is an outsider by the level of investment, production and export potential with a pronounced interregional differentiation of grain production and export. Institutional heterogeneity of the group's regions predetermines the need for more active involvement of small businesses in innovation processes. It is recommended to use the strategy of integration of small enterprises into agro-innovative production chains and the strategy of promoting innovation transformation of small businesses on the basis of state support for the use of innovation resources.

The fifth group has in-depth specialization in grain production and export with relatively high innovation potential. However, the gap between the scale of investment and exports indicates the potential for further increase in investment and innovation activity. We recommend a strategy to promote infrastructural innovation transformation of the production potential of grain production.

The formulated strategies are applicable to specific types of regions and are aimed at forcing the processes of innovation and investment

development in order to create a high-technology food export sector. Strengthening of innovation and investment activity in the agricultural sector is possible if the state policy measures are implemented in the direction of stimulating the creation, transfer and use of knowledge, technology and innovation; attracting investment in the implementation of high technology projects in order to overcome the differentiation of technological development at the territorial and sectoral levels. To address this issue, it is important to harmonize innovation and investment policy at the federal and regional levels. A significant role in the creation of a new technological basis for the agro-industrial complex and export sector is assigned to a wider application of such tools as the formation of portfolios of regional investment projects using the "investment standard"; redistribution of budget funds for the completion of construction and commissioning of capital projects; compensation of part of capital costs for export-oriented projects; providing benefits to investor companies in order to implement major infrastructure projects.

Conclusion

The problem of formation of export-oriented agricultural economy is associated with the need to assess its innovation and investment activity and monitoring the quality of state policy to promote innovation and knowledge-intensive products in agricultural production. Based on the developed model of the relationship between investment in fixed capital in agriculture, gross output of the industry and agricultural exports using the method of cluster analysis, we built our typology of RF constituent entities; we assessed the production, innovation and investment and export potential of the five typological groups.

The novelty and significance of the developed model lies in the possibility of its use for assessing

and monitoring the state of territorial, sectoral and regional innovation and investment agrosystems.

The results of the empirical study reveal the presence of significant imbalances in the level of innovation and investment activity at the interregional and sectoral levels, hindering the increase in the scale of food exports. In order to eliminate the disproportions, differentiated strategies of state regulation aimed at overcoming the limitations of low innovation-investment activity in the formation of export-oriented agricultural economy and enhancing the processes of innovation-investment development were proposed.

The results of the study are of practical value for the development and implementation of targeted mechanisms and tools to improve the efficiency of innovation and investment activities

in order to ensure the leading position of the regions in exports of agricultural products. The implementation of the formulated conclusions, developed approaches and methods will provide a comprehensive approach to the analysis and assessment of the effectiveness of regional agrofood systems.

Further development of research involves refining the set of indicators of the level of technological development of a region; implementation of methodological approaches to the assessment and forecasting of the optimal level of investment in the agricultural sector of Russian regions in order to increase export potential; adjustment of methodological approaches to the allocation of budgetary funds for the development of the agro-industrial complex, considering the priorities of export potential development.

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Global Megatrends and New Technologies: Challenges for and Threats to the Post-Industrial Economy*



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Abstract. The paper considers the influence of megatrends, currently acting as drivers of changes taking place in society, on the structure of the emerging economy of post-industrial society. Under their influence, a new economy is formed, focused on the use of such a resource as time, the amount of which, available to people, is increasing as robotomics develops. The research is based on the study of five global trends in the development of modern society: demographic transformations; natural resources depletion and climate change; changing geo-economic and geopolitical landscapes; digitalization and development of new technologies; comprehensive human welfare: wealth, health and knowledge. The article proves that these trends seriously challenge the future of humanity and fundamentally change the structure of the economy and employment. The response to the megatrends challenges is the formation of new directions in the economic structure that help to respond to them and deal with their negative implications. We establish that megatrends have contributed to the development of such areas as silver economy, circular economy, robotomics, peer-to-peer economy, and laid the foundation of a spiritual and moral economy and leisure economy. The work concludes that there are prerequisites in society for the transition to the economy, in which social effects will prevail over economic ones. High level of technology development and digitalization help to make such a transition to an “economics with a human face”. The formulated

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principles of adaptation to the emerging economy enable countries to develop a transition strategy with minimal social and economic costs. The novelty of the research consists in comparing megatrends with changes occurring in the structure of the economy and the labor market, as well as in substantiating social orientation of the post-industrial economy, which is formed under the influence of global trends in social development.

Key words: megatrends, silver economy, circular economy, peer-to-peer economy, robotomics, leisure economy.

Introduction

The Fourth Industrial Revolution, which has turned the life of modern society upside down, is rapidly changing the established lifestyle generating new challenges and threats. Revealing unprecedented prospects to the world, technological progress also raises a lot of questions. What will the world be like? How will new technologies affect humanity? What place in this new world will be assigned to a person with their knowledge and skills? What professions do you need to master in order to stay a part of the post-industrial society?

Such questions are important because the experience of the previous industrial revolutions has shown their enormous impact on the labor market. During the First Industrial Revolution, which marked the beginning of the transition from manual labor to machine labor, there was a primary displacement of physical labor, which was massively developed during the Second Industrial Revolution. The Third Industrial Revolution, marked by electronics development and the advent of computers, served as an impetus for displacing the intellectual labor from the labor market which is now beginning to acquire a mass character [1].

In addition, the transformation of modern society and the economy is significantly influenced by global processes, related to climate change, political structure, demographic situation, etc.

The purpose of the study is to review global trends in social development and assess their impact on the emerging image of the post-industrial economy, the main characteristic of which is a high-impact industry with a greater

degree of automation and low employment. In this regard, the paper attempts to find answers to two related questions. The first question is: how is the economic structure and the labor market changing under the influence of modern global trends? The second one is: how do these changes affect the appearance of the post-industrial economy? Despite the fact that an analysis of the impact of megatrends on certain aspects of economic and social development is occasionally found in the literature (see, for example: [2; 3]), a full-scale assessment is carried out for the first time. In addition, the novelty of our work is formed by the combination of economic and social aspects in studying the future economic structure.

Global megatrends: what is changing the world

The formation of the post-industrial society is inextricably linked with megatrends – large-scale social, technological, economic, political and environmental changes taking place in society and having a global impact on most types of human activity and the world as a whole.

J. Naisbitt began studying megatrends in 1982; he identified 10 global processes that determined the shape and essence of the emerging information society in the United States for the next two decades [4]. Despite the fact that the futurological approach to the analysis of megatrends has not found wide application, expert and analytical interest in this issue has rapidly spread around the world. Modern researchers consider megatrends as integral properties of the international political system, defined by its basic characteristics [5].

The literature rarely touches upon the question of the origins of the prevailing trends. Generally, megatrends are identified as a reflection of a certain sequence of the previous events [6]. For instance, according to the authors of [7], the collapse of the bipolar system and the subsequent change in the world order gave rise to modern global trends. The article [8] clarifies that the formation of megatrends was facilitated by the transformation of the world's political organization at least at three levels: the Westphalian system, interstate relations, and political systems of particular states, the simultaneous change of which led to the effect of a "perfect storm" [9], which influenced the trends' development. However, the main scientific discourse focuses on the degree of human influence on developing global trends.

Several points of view have been formed regarding this issue. Some researchers associate the formation of megatrends mainly with the anthropogenic factor considering them a reflection of the Anthropocene epoch [10]. Others tend to believe that the formation of megatrends is more determined by the cyclical nature of the political process, which is explained by the action of Kondratiev waves of economic upswing and downturn [11] and consists of a phase of evolution (ordering of structures) and a phase of chaoticization [12]. Still others correlate the emergence of global trends with natural processes. The discussion is most clearly manifested in relation to trends in climate and ecology. According to estimates, 97% of climate scientists associate the ongoing climate changes with human activity [13; 14] and indicate the need for society to respond to these changes [1]. Against such estimates, there are diametrically opposite points of view, according to which global warming, as well as global cooling, is caused by natural factors and is cyclical [15; 16], and is determined by the lack of consensus on the human role [17] and is even a "global deception" of political nature [18].

The study of global megatrends is a research topic mainly of foreign and Russian organizations, and is quite rare in scientific reviews. For example, in 2010, the European Parliament initiated the creation of the European Strategy and Policy Analysis System (ESPAS) project, whose tasks include constant monitoring, analysis of global trends affecting the EU development, and identification of problems, caused by them. The reports, published by the organization, note the pessimistic nature of almost all foresight studies, although this pessimism is not always objective, but rather caused by the fact that humans are, genetically speaking, biased towards the negative¹.

Among the organizations monitoring global trends that can dramatically affect the economy and society are the American research organizations: Gartner, Accenture, International Data Corporation (IDC) and Future Today Institute, British audit and consulting company Ernst & Young, which has offices in more than 150 countries, Danish analytical center Copenhagen Institute for Future Studies (CIFS), German Institute for the Future ZukunftsInstitut and the research company TrendOne, Canadian analytical Internet portal TrendHunter, Russian National Research University Higher School of Economics and a number of other institutions.

The number of megatrends, allocated by them, is quite diverse and varies from several units to dozens depending on the detail of degree. For example, CIFS defines 7 megatrends, ZukunftsInstitut – 12, TrendOne – 16, and TrendHunter – 18². The authors of the Global Education Future report on the future of education believe that four megatrends will influence global social and economic transformations in the coming

¹ ESPAS Report 2019: Global Trends to 2030. Available at: <https://espas.secure.europarl.europa.eu/orbis/node/1362>

² How many megatrends are there in fact. Available at: <https://ekhramkova.medium.com/сколько-на-самом-деле-мегатрендов-ec520e3ccc44>

decades: digitalization, automation, transformation of social institutions and demographic changes³.

Despite the fact that experts from various organizations identify a different number of global trends affecting the modern world order, all of them can be combined into five enlarged groups, which are most often discussed in ongoing research. For example, in the report of the Organization for Economic Cooperation and Development (OECD), commissioned by the Danish Ministry of Science, Technology and Innovation in 2016, the main megatrends include population growth, migration and aging; balance of water and energy resources, climate and food security; changing geopolitical and geo-economic landscapes; economic digitalization; wealth, health and education of nations⁴. Such megatrends will shape the socio-economic development strategies of nations in the coming decades.

The Higher School of Economics highlights similar trends in the study; the authors note that the prospects for Russia's development are largely determined not only by scientific and technological potential, but also by the action of global trends, related to changes in the natural environment, demographic and social transformations, transition to new models of economic growth, changes in the geopolitical situation and global management systems, formation of a new paradigm of scientific and technological development [19].

Our work analyzes the impact on the economy of five enlarged groups of megatrends which are an important part of existing studies. These include demographic transformations; depletion of natural resources and climate change; changes in geo-economic and geopolitical landscapes;

digitalization and development of new technologies; complex well-being of mankind: wealth, health and knowledge. This choice is due to the fact that the areas under consideration generally accumulate reference points of human development: demography, ecology, technology, politics, and economics.

It is worth noting that the influence of these trends should be considered only in combination, as they are closely intertwined with each other and are capable of both strengthening and leveling the effect of each other. For example, the development of biotechnologies directly correlates with demographic changes; energy technologies help in solving environmental problems, most of which at one time were generated by technological progress. In turn, depletion of natural resources contributes to the development of alternative energy, and transformation of geopolitical landscapes radically changes the complex well-being of mankind.

Therefore, only a comprehensive study of megatrends will help to understand the prospects of the emerging world and prepare for the coming changes in time. Let us see more details of each of the megatrends and assess the potential threats and possible changes in the economy which are facilitated by the ongoing transformations.

Demographic transformations

Global trends in demography are primarily associated with the continued growth of the world's population, an increase in life expectancy, aging, an increase in urbanization processes and the smoothing of migration overflows against the background of the increase in the absolute value of the number of migrants.

According to the UN forecasts, the world's population will increase by almost a quarter by 2050 and will amount to 9.7 billion people, and by 2100 it will increase to 11.2 billion people⁵. The growth

³ Education for complex society. Available at: <https://drive.google.com/file/d/0B9ZvF6mQ5FMbSTFKVmhodU5rNTNiTXpUZ2QwZktiR0pzSmJR/view?resourcekey=0-d3FGUmpdKpcCi8CgLVHqXQ>

⁴ An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy. Available at: <https://ufm.dk/en/publications/2016/files/an-oecd-horizon-scan-of-megatrends-and-technology-trends-in-the-context-of-future-research-policy.pdf>

⁵ The World Population Prospects: 2015 Revision. Available at: <https://www.un.org/en/development/desa/publications/world-population-prospects-2015-revision.html>

will occur mainly at the expense of African countries, while in developed countries the stagnation processes will continue, as a result of which the share of their population may decrease to 13.6% from 17.5% in 2013 and 32.2% in 1950⁶. Thus, over a century, the share of the population of developed countries in the world may decrease almost 2.5 fold.

This is not the only threat from demographic changes to the developed countries. In the coming decades, absolutely multidirectional processes will occur: a sharp surge in the number of young people on the African continent against the background of aging Europe, Asia and Latin America. It is predicted that by 2050, the number of people over 60 years old will increase to 2.1 billion people against the current 900 million and global parity will be achieved between this population group and children under the age of 15. In addition, the proportion of the population aged over 80 may reach unprecedented value: according to forecasts, by 2050 it may approach 10%, and in countries such as Germany, Italy, Japan and South Korea, it may even overcome the 15%⁷ barrier. Thus, by the end of the century, the median age may grow from current 27 years to 41 years⁸.

Another predicted trend is the accelerated urbanization. For example, if in 1950 the share of urban residents was 30% of the total population, then a century later a complete transformation of the ratio of urban and rural residents is expected: 32% will be the share of rural population. At the same time, in a number of countries, the share of urban population already exceeds 85% (for example, Singapore (100%), Argentina (91.9%),

the Netherlands (91.5%), Brazil (86.6%), Australia (86.0%), etc.)⁹.

Urbanization processes challenge existing urban management systems, the lack of improvements in which (including through the formation of “smart” cities, where various communication and transport networks will be linked into a single system that supports sustainable and efficient use of resources and their management) can contribute to increasing inequality in society, extensive slum formation and the growth of social conflicts¹⁰.

Demographic processes in Russia generally correspond to the trends of developed countries: population decrease, declining birth rate, population aging, and reduction in migration flows. According to the UN, by 2030, the country’s population is 95% likely to be in the range from 141.0 to 146.0 million people, and by 2100 – from 103.0 million to 160.0 million people¹¹. Therefore, even under the most favorable scenario, it is unnecessary to expect a significant increase in the country’s population. At the same time, in the next decade, the share of people over age 60 in the total population over age 15 is projected to increase by 2 p.p., as a result of which 533.8 people over age 60 will account for every thousand people of working age¹². Against the background of these trends, the growth rate of migration flows will decrease to 0.6% per year against the current 1.3%¹³.

⁹ Forecast of urban and rural population of the world, 2018. Available at: <http://www.demoscope.ru/weekly/2018/0775/barometer775.pdf>

¹⁰ An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy. Available at: <https://ufm.dk/en/publications/2016/files/an-oecd-horizon-scan-of-megatrends-and-technology-trends-in-the-context-of-future-research-policy.pdf>

¹¹ Population Division. World Population Prospects 2019. Available at: <https://population.un.org/wpp/Graphs/Probabilistic/POP/TOT/643>

¹² The elderly population of Russia: problems and prospects. Available at: <https://ac.gov.ru/files/publication/a/8485.pdf>

¹³ Russia’s population until the end of the century according to the UN forecast revision of 2019. Available at: <http://www.demoscope.ru/weekly/2019/0829/barom03.php>

⁶ The world’s population will grow, age, live longer and migrate less. Available at: <https://iq.hse.ru/news/177669242.html>

⁷ The World Population Prospects: 2015 Revision. Available at: <https://www.un.org/en/development/desa/publications/world-population-prospects-2015-revision.html>

⁸ The world’s population will grow, age, live longer and migrate less. Available at: <https://iq.hse.ru/news/177669242.html>

It is worth noting that there are alternative estimates according to which the peak of the world population will be reached by 2064, after which the world population will decrease to 6.29–8.79 billion people, and the fertility rate will drop to 1.52–1.66. Against this background, as in the UN forecasts, serious shifts in the age structure and reduction in the working-age population are expected, especially in countries where a more than twofold decrease in the number of inhabitants is predicted (for example, Japan, Spain, Thailand, Ukraine, etc.). However, a number of states (USA, Canada, Australia, etc.) will be able to maintain the size of labor force due to migration flows [20]. Such significant discrepancies, according to the authors' opinion, are due to the difference in the approaches used in forecasting: the UN estimates are based on a deterministic model of fertility, mortality and migration, while alternative calculations consider progress in women's education and increased access to contraceptives as determining factors [20]. Despite the beneficial effect of reduction in the total world population on environmental and climate change, the expected demographic shifts are fraught with serious negative economic and financial consequences associated with a decrease in innovation activity, reduction in consumer goods markets, and a drop in GDP growth [20].

The published estimates caused quite active discussions in one of the leading medical journals *The Lancet*. Their essence can be reduced to the fact that it is necessary to expand the list of influencing factors [21; 22] and conduct a thorough critical analysis of the results obtained, as they can fundamentally change the strategies of further social development [23; 24].

Nevertheless, it is already obvious today that emerging trends are changing the economic structure and creating new requirements for the labor market including the need to increase the retirement age and development of the so-called *silver economy* which implies both the use of human

capabilities during aging, and the expansion of traditional infrastructure for this generation (healthcare, social security) and those segments of it that were previously in little demand (leisure, tourism, educational) [25].

The silver economy generates changes not only in the labor market, but also in the structure of production of goods and services, stimulating the emergence of new market niches and sectors (for example, gerontomarketing) [26]. According to the European Commission estimates, in the coming decades it should become one of the drivers of developing the national economy and economic growth [25]. Already today, it makes a significant contribution to the economy of the developed countries. For example, in France 53% of economic demand is provided by elderly people, in the USA more than half of household spending is accounted for by people aged over 50, in Germany the consumer purchasing power of those aged over 64 is estimated at 316 trillion euros [25; 26]. According to the EU estimates, by 2060 the share of consumption provided by the silver economy will amount to 25% of GDP [25].

In Russia, the silver economy is still poorly developed, which is largely due to the low security of citizens of retirement age. However, the prospect of increasing life expectancy, which is one of the national development goals of Russia, exacerbates the need for its development and addressing the problem of ensuring healthy and active aging.

Depletion of natural resources and climate change

World population growth, combined with strengthening anthropogenic impact and increased economic well-being, contribute to the depletion of natural resources, ecosystem degradation and climate deterioration.

One of the most serious consequences of destructive human activity is an increase in global temperature, which is expected to grow by 1.5 degrees by 2030 relative to the middle of the last

century¹⁴. The greenhouse effect not only disrupts the planet's climate, which manifests itself in frequent weather anomalies, but also destroys existing ecosystems, contributes to the extinction of entire animal populations and the disappearance of a large number of plants. The seriousness of the situation lies in the fact that even with the complete cessation of all emissions into the atmosphere, the negative consequences of the accumulated effect to date will be felt for the next 40 years. Obviously, such a scenario is absolutely unworkable; at the same time, the absence of any constructive solutions may contribute to the fact that climate change will become uncontrollable and may lead to humanity death.

The most realistic scenario is the transition to renewable low-carbon energy sources. For instance, by 2040, the global demand for primary energy is projected to grow by 37% compared to 2012. The largest growth is expected in the chemical industry due to an increase in demand for plastics and other chemicals, as well as in the commercial transport and household sectors, where a widespread transition to cleaner fuels is expected. However, in order to significantly reduce global greenhouse gas emissions (by 40–70%) the share of low-carbon energy supply should increase by more than 80% which remains an unsolvable task. The use of renewable energy sources has the opposite effect. For example, a 55% increase in industrial demand for water expected by 2050 could lead to more than 40% of the world's population experiencing serious water shortages, especially in Africa and Asia¹⁵.

At the same time, we should consider that developing countries will make the greatest

contribution to environmental pollution in the coming decades due to the expected development of their economies. For example, the rapid development of China's economy in the previous 30 years has led to an increase in environmental pollution by 15 times [27]. Modern technologies could help to avoid such a scenario. However, another problem arises here: developing countries often do not have such technologies, and there may not be funds to purchase them. This creates a dilemma: on the one hand, the advanced technologies that developed countries have contribute to their leadership, on the other, the threat of an environmental catastrophe actually forces developed countries to either sell these technologies to laggards to the detriment of their economic superiority, or hinder the economic development of the latter, for example, by imposing various sanctions and restrictions.

The ongoing climate warming against the background of the world's population growth and increased competition for natural resources poses a threat to global food security associated with food underconsumption, a decrease in the quality of nutrition and a change in its structure¹⁶. Environmental pollution has a negative impact on living standards and population health, and depletion of hydrocarbon reserves contributes to a decrease in economic growth in resource-oriented economies.

For Russia, the most significant threats in this direction are the accumulation of environmental damage and its negative impact on people's lives and health, resource dependence, increasing frequency of environmental disasters (hurricanes, floods, forest fires, etc.), depletion of productive lands and threat to food security associated with the sanctions imposed on the country.

The development of the *circular economy*, based on resources renewal and the processing of

¹⁴ Global Trends to 2030. Challenges and choices for Europe. Available at: https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/ESPAS_Report2019_V14.pdf

¹⁵ An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy. Available at: <https://ufm.dk/en/publications/2016/files/an-oecd-horizon-scan-of-megatrends-and-technology-trends-in-the-context-of-future-research-policy.pdf>

¹⁶ The state of food security and nutrition in the world. Available at: <http://www.fao.org/3/ca5162ru/ca5162ru.pdf>

secondary raw materials, can be considered a response to the megatrend under consideration [28; 29]. The transition to a resource-efficient society is the inevitable future of all countries of the world, without which the planet loses its chance to survive and which opens up huge prospects not only for the environment, but also for the economic sphere. According to the World Bank estimates, by 2050, in the absence of a global modernization of the waste disposal system, their number will increase by 70% [30]. According to the OECD, the transition to waste-free production can not only reduce the extraction of natural resources and waste generation by up to 80% compared to the production of new products, but also reduce greenhouse gas emissions by up to 90%¹⁷. The economic effect of the reuse of materials in the future can reach more than a trillion dollars a year¹⁸.

At the same time, the analysis of the circular economy influence on the economic growth has showed unfavorable relationship with a decrease in the negative result in the long term, as well as a lower adaptability of developed cities to the closed-loop economy, due to the high level of resource development preventing a rapid transition to a qualitatively different development path [27].

Programs for developing the circular economy have already formed the basis of the state policy in such countries as Japan, South Korea, the USA, Denmark, Germany, France, China, etc. Russia has relatively recently started moving toward the circular economy. Significant steps in this direction were the “garbage” reform that unfolded in the country in 2017 and the Industrial Development Strategy for Processing, Recycling and Neutralization of Production and Consumption Waste approved by

¹⁷ Business Models for the Circular Economy. Available at: <https://www.oecd.org/environment/waste/policy-highlights-business-models-for-the-circular-economy.pdf>

¹⁸ An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy. Available at: <https://ufm.dk/en/publications/2016/files/an-oecd-horizon-scan-of-megatrends-and-technology-trends-in-the-context-of-future-research-policy.pdf>

the Government of the Russian Federation in 2018 for the period through to 2030, when the principles of environmentally safe waste management and disposal with an emphasis on recycling and involvement in economic turnover were laid down. At the same time, there are two key barriers that hinder the development of the circular economy in Russia: the inhibition of the country’s innovation development associated with high corruption level, raw material structure of the economy, sanctions policy against Russia, etc., as well as cultural and economic barriers, such as mentality, underestimation of the seriousness of environmental threats, lack of a long planning horizon, etc. [31].

Changing geo-economic and geopolitical landscapes

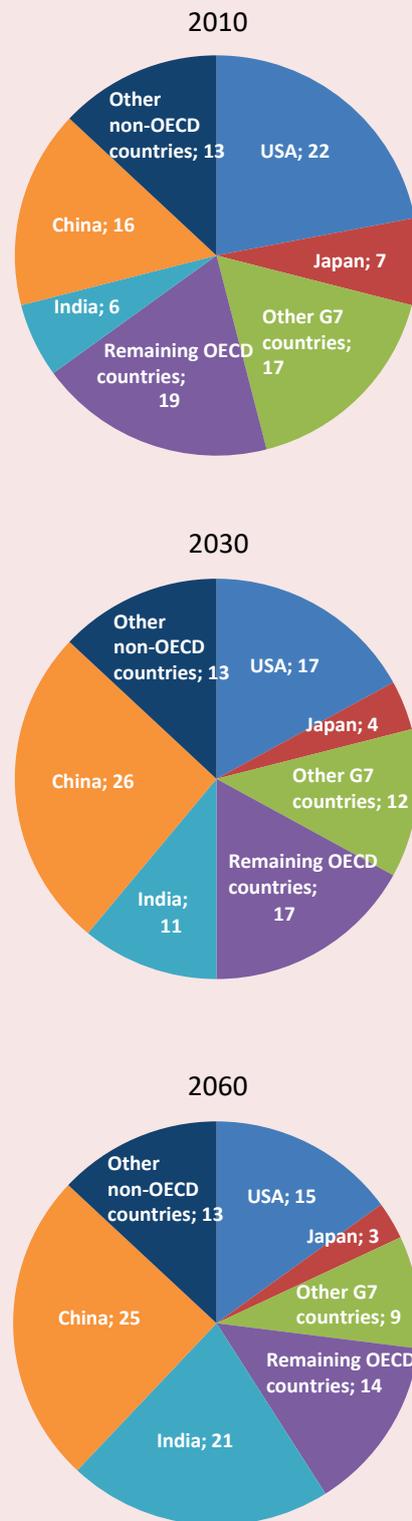
This trend is formed by two large-scale processes that have captured modern society: the transition to a multipolar world and globalization. The first is a consequence of the defeat of the USSR in the Cold War which, as time has shown, marked the beginning of the loss of the world hegemony of the United States [32]; the second is the result of rapid development of electronic means of communication and technologies that allow easily moving around the world.

The main global threat that accompanies these processes is the geopolitical inversion with its characteristic struggle of states for world leadership and the accompanying growth of geopolitical instability and armed conflicts, creation of trade barriers, especially in the technology sector, as well as increased foreign policy pressure and aggravation of global security problems [33].

In the coming decades, the gravity center of the world economy is expected to shift towards Asia (*Fig. 1*), as a result of which by 2050 only one European country – Germany¹⁹ – may remain

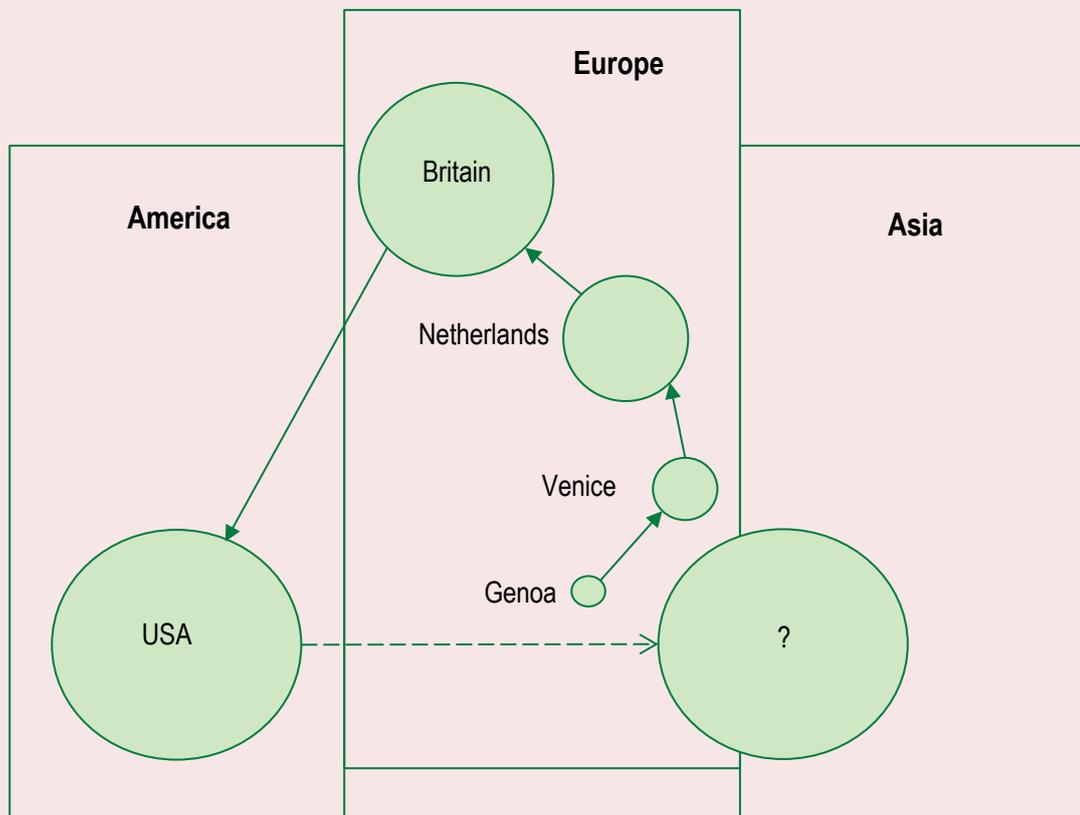
¹⁹ Global Trends to 2030. Challenges and choices for Europe. Available at: https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/ESPAS_Report2019_V14.pdf.

Figure 1. Share of countries in world GDP in 2010, 2030, 2060, %



Source: An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy, p. 24.

Figure 2. Stylized scheme of the history of the movement of world capital centers



Source: Balatsky E.V. Prerequisites for global geopolitical inversion. *Economic and Social Changes: Facts, Trends, Forecast*, 2014, no. 2 (32), pp. 36–52. DOI: 10.15838/esc/2014.2.32.4

among the eight largest economies in the world. At the same time, the question of which country will become the new world economic center remains open (Fig. 2).

Among the possible candidates for the world leader are India, Pakistan, Brazil, but the most frequent controversy is around China and Russia [34]. Studies show that a state with a resource reserve [35], as well as having territorial and demographic potential [33], can claim the hegemon role. Despite the formal compliance of both China and Russia with these characteristics, many researchers agree that these countries are not yet ready to take the leadership [33; 35; 36].

One of the key arguments in favor of the above is that China, by joining the “club” of the developed

countries, accepts existing rules, and does not create new ones, i.e. does not form a new order. In addition, its path is unique and difficult to implement, which makes it unattractive for other countries wishing to repeat China’s economic breakthrough [35; 36]. Russia is also not yet ready to become a world leader, as it is itself a semi-periphery country [37], which needs to create an effective model of resilient society and an attractive image of the future for the world [35].

However, many researchers think that it is not individual states that will claim the role of hegemons, but their unions (EU, EAEU, BRICS, etc.) [35; 36; 38]. In this context, new prospects are opening up for both Russia and China allowing them to claim the role of world leaders as part of

advanced alliances. At the same time, universities with their ability to respond to changes taking place in the world are considered the cornerstone of civil society in countries that will play a key role in the global world arena in the coming decades [39]. Already today, advanced university systems are forming programs that are ahead of time and integrate future technologies into the existing reality.

In particular, in 2008, the Singularity University, one of the most innovative educational institutions in the world, was established in one of the academic buildings of NASA in Silicon Valley. The University has united the advanced minds of mankind, who strive not only to explore advanced technologies of the future, but also to promote their use to address global issues. Training at the university is focused on senior management personnel and all creative strategists who want to transform their field of activity, takes place in the form of short-term immersive courses including the study of modern technologies, transformational practices and lectures by leading scientists of the world.

The Future of Humanity Institute functions as part of the University of Oxford of Faculty of Philosophy; the MIT Media Lab, which is the world's leading platform to study modern media technologies, is organized at the Massachusetts Institute of Technology; the Stanford University implement the Stanford BIO-X interdisciplinary program supporting advanced research in the field of bioengineering and biomedicine.

The uniqueness of these projects lies not only in the fact that they are embedded in educational processes and give students the opportunity to directly participate in the creation of future technologies, but also in the fact that they are focused on retraining the teaching staff, reformatting approaches to learning and, most importantly, creating a new way of thinking not only among students, but also among the teaching staff.

Geopolitical and geo-economic transformations, in addition to revising learning strategies,

threaten to the economy's restructure. Today there is a lot of talk about the decline of the capitalist way of life and what can replace it. As one of the alternatives, the *peer-to-peer economy* is considered, the development of which is associated with the formation of a network information society and the creation of various economic coalitions [40]. This economy is based on the participants' equality and marks the transition from hierarchy to decentralization. Against the background of increasing openness and competitiveness of the economy, reorientation to the social significance of the final result and assistance in reducing inequality, monetary compensation of labor ceases to be an end in itself of peer-to-peer production, which, in fact, is equivalent to undermining the basic foundations of capitalism and the formation of fundamentally different development strategies.

Thus, transformation of the existing geopolitical and geo-economic situation in the world can serve as a factor hindering the economic development of society due to the obstacles posed to countries claiming primacy and threatening modern leaders, as well as an incentive to form fundamentally new coalitions and alliances that contribute to the reform of the global governance system and the restructuring of the global economic system.

Digitalization and development of new technologies

Rapidly developing technologies reveal to the world a wide range of opportunities, primarily related to the creation of new markets and increasing labor productivity. Despite the fact that so far their impact on productivity growth is not as strong as during earlier industrial revolutions [41; 42], a significant breakthrough in this direction is expected in the coming decades including through the development of digital technologies, such as artificial intelligence and machine learning tools [43].

Many organizations including those mentioned above, are constantly monitoring and researching

Table 1. Forty key technologies of the future according to the OECD

Digital technologies	Biotechnologies
Cloud computing Block chain Simulation modeling and games Artificial intelligence Photonics and light technologies Robotics Quantum computing Distributive computing Big analytics Internet of things	Bioinformatics Personalized medicine Health monitoring technologies Medicine and bioimaging Neurotechnologies Biochips and biosensors Stem cells Regenerative medicine and organ cultivation Biocatalysis Synthetic biology
Energy and environment	New materials
Smart grid Driverless cars Electric cars Drones Carbon capture and sequestration Wind turbine technologies Hydrogen energy Marine and tidal energy Photovoltaics Microgeneration Micro- and nanosatellite Biofuel Fuel element Advanced energy storage technologies Precision agriculture	Nanomaterials nanodevices Additive manufacturing Carbon nanotube and graphene Functional materials
Source: An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy, p. 8.	

promising technologies that can change the world. The most frequently identified, according to the OECD, are 40 technologies in four key areas: digital technologies, biotechnologies, energy and environment, new materials (*Tab. 1*).

It is obvious that new technologies are new opportunities for society, new markets, new mechanisms for addressing demographic, environmental and social issues. As noted earlier, the development of each of these areas has a direct impact on the rest of megatrends. Moreover, this megatrend is the only one that contributes to the technological and economic progress of society. On the other hand, it significantly transforms labor market and creates high risks of technological unemployment. This is especially affected by the development of digital technologies. In particular, large-scale automation of the economy contributes to the formation of a fundamentally new paradigm of scientific, technical and economic development

associated with the formation of *robotomics* – an economy, based on the widest introduction of robots to replace human labor²⁰.

According to various estimates, even if the current pace of technological development continues in the coming decades, 47% of jobs in the United States can be replaced by machines [44]. If the economy fails to respond properly to these changes and create new jobs, then one of the world's most significant achievements may turn into one of the largest social cataclysms associated with the formation of a class of “unnecessary” people and catastrophic stratification of society.

Tracking structural shifts in the labor market and forecasting future changes in the composition of professions are one of the key tasks for organizations dealing with employment and labor

²⁰ Balatsky E.V. The end of the illusion of economic growth. Available at: <https://www.if24.ru/konets-illyuzii-ekonomicheskogo-rosta/>

relations. In particular, projects under the general title “The Future of Work” are carried out by such major organizations as McKinsey & Company, the OECD, the International Labor Organization, and the European Commission; with the support of the Agency for Strategic Initiatives and the Skolkovo Innovation Center, the Atlas of New Professions is published. A similar initiative is being implemented by the HSE (the Atlas of Professions of the Future has been published, dedicated to identifying promising areas of employment).

Summarizing the conclusions, obtained in the studies of these organizations, we can note the projected increase in demand for leisure and the concomitant creation of new branches of the leisure and entertainment industry; the growing need for specialists capable of inventing and creating new technologies, goods and services, business models; the shift of workers of different qualifications to the construction and infrastructure sector. In addition, the demand for education and healthcare workers is expected to increase²¹. All this correlates with a study by the consulting company Boston Consulting Group (BCG), which estimates that by 2025, automation is projected for 81% of almost a fifth of all jobs in the world, as a result of which up to 50% of existing professions may disappear²².

For Russia, this problem is not so acute yet, because, according to BCG estimates, robotization in it remains exotic and there is no reason to expect a sharp surge in widespread automation. Despite this, by 2025, about 10 million people may lose their jobs in areas where replacement of human labor is possible, against the background of the formation

²¹ Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation. Available at: <https://www.mckinsey.com/~/media/mckinsey/industries/public%20and%20social%20sector/our%20insights/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi-jobs-lost-jobs-gained-report-december-6-2017.pdf>

²² Russia 2025: from personnel to talents. Available at: https://image-src.bcg.com/Images/Russia-2025-report-RUS_tcm9-188275.pdf

of an almost six million deficit in specialists in new areas²³.

Modern research as a solution to this problem suggests shifting the emphasis to the field of creative professions²⁴ and the knowledge economy [45]; expand self-employment opportunities in sectors with little prospects for robotization [46]; explore the possibility of moving to a broader division of labor and shortening the working week²⁵; ensure the growth of online platforms connecting freelancers and companies in different parts of the world²⁶. Moreover, a serious transformation of the higher education system under the emerging economic model is needed, aimed at strengthening the regional component of education and its orientation to the needs of the real economy.

Comprehensive well-being of humanity: wealth, health and knowledge

This megatrend is quite closely intertwined with the previous ones, as there is no doubt that the nation’s wealth, health and education are directly influenced by the economic development of society, demographic factors, and ecology.

According to PricewaterhouseCoopers (PwC) estimates, global GDP will maintain a growth rate of 3% per year in the coming decades, which will lead to its more than twofold increase by 2050 relative to the beginning of the century²⁷. This will contribute to the growth of per capita income and wealth accumulation, and in most developing countries, the growth of per capita income will be accompanied by an increase in population, while

²³ *Ibidem*.

²⁴ Which professions will disappear by 2030? Available at: <https://futurehub.winningthehearts.com/kakie-professii-ischeznut-k-2030>

²⁵ Skidelsky R. Rise of the robots: What will the future of work look like? *The Guardian*, 19 February 2013. Available at: <https://www.theguardian.com/business/2013/feb/19/rise-of-robots-future-of-work>

²⁶ Sundararajan A. The ‘gig economy’ is coming. What will it mean for work? *The Guardian*, 26 July 2015. Available at: <https://www.theguardian.com/commentisfree/2015/jul/26/will-we-get-by-gig-economy>.

²⁷ The World in 2050. Available at: <https://www.pwc.com/gx/en/research-insights/economy/the-world-in-2050.html>

in developed economies, the increase in per capita GDP will be caused not only by economic factors, but also by population decline.

Despite this trend, the stratification of society in the world will continue and may even increase within individual countries [47; 48]. According to the charity Oxfam, in 2020, the fortune of 2,153 billionaires on the planet accounted for 60% of the funds available to the rest of the world's population²⁸, and the coronavirus pandemic, provoked the strongest labor market crisis in the last 90 years, will contribute to an increase in inequality on a scale that has not been observed for a century²⁹. The widening gap is largely due to the significant growth of "extremely poor" people, whose daily expenses do not exceed 1.9 US dollars. According to the World Bank estimates, in the coming years, their number as a result of the COVID-19 pandemic will increase by 150 million people and will amount to about 9.4% of the world's population³⁰.

Against the background of digitalization and the threat of technological unemployment, inequality can contribute to an even greater stratification of society, as it undermines the educational possibility for those who are below the poverty line, thereby depriving them of any chance to compete in the labor market. At the same time, it is digitalization that will create additional opportunities for access to education. The COVID-19 pandemic that has engulfed the world has accelerated the development of distance learning, which is actively developing today along with traditional forms and makes education more accessible and less costly.

²⁸ Oxfam: Billionaires are richer than 60 percent of the world's population. Available at: <https://www.dw.com/ru/oxfam-миллиардеры-богаче-60-процентов-населения-мира/a-52078410>

²⁹ The Inequality Virus. Available at: <https://oxfamlibrary.openrepository.com/bitstream/handle/10546/621149/bp-the-inequality-virus-summ-250121-en.pdf>

³⁰ The World Bank has predicted the first jump in the number of "extremely poor" in 20 years due to COVID-19. Available at: <https://www.forbes.ru/newsroom/finansy-i-investicii/410753-vsemirnyy-bank-sprognoziroval-pervyy-za-20-let-skachok-chisla>

In addition, an increase in the number of people with the Internet access will also expand access to knowledge and provide new opportunities in the labor market.

It is worth noting that the issue of social inequality and its impact on economic growth is quite controversial. On the one hand, no one doubts the negative social aspects of inequality associated with injustice in income distribution, the enrichment of the minority at the expense of the majority, and the growth of social tension. However, when studying the inequality impact on economic growth, we have obtained the results indicating that society needs a normal inequality level for the effective functioning of the economy³¹, as it is inequality that creates incentives for personal initiative and promotes innovation and investment, and consequently economic progress. The main task that the state faces with regard to inequality is to find a certain balance between economic efficiency and social justice [50].

Population growth, urbanization, migration, international tourism, climate change, population aging, increasing inequality – all these processes pose a serious challenge to the health sector, as they contribute to changing the landscape of diseases including in countries with developed economies. Despite all the achievements in medicine, the UN forecasts are disappointing: in the coming decades, the emergence of new infectious diseases is predicted against the background of the development of antibiotic resistance; the increasing risks of local epidemics and global pandemics; an increase in mortality from non-communicable diseases, such as cardiovascular diseases, cancer, diabetes; an increase in cases of neurological disorders including Alzheimer disease and depressive states.

³¹ Normal means such inequality, in which there is no absolute poverty, and the existing poverty level does not create obstacles to implementing vital social and economic functions [49].

Thus, the coming decades pose a global challenge to the complex well-being of mankind, on which the development of human capital will largely depend which determines not only the economic potential of society, but also its equally significant spiritual component. In order for the world not to be on the verge of a social catastrophe, it is necessary to build the *spiritual and moral economy* based on the principles of justice and focused on investments in universal public services (health, education, social security, etc.), guaranteed income and employment and redistribution of wealth. And this is, apparently, a transition to a fundamentally different type of economic relations and a new stage of social evolution³².

Economic socialization: on the way to a new society

The analysis made it possible to assess the impact of megatrends on the economic structure and formulate a number of conclusions.

First, we have determined that each of the considered megatrends has a significant impact on the economy and labor market contributing to the emergence of new directions in the structure of the post-industrial economy (*Tab. 2*). The emerging directions are aimed not only at mitigating the possible negative consequences of global trends, but also at adapting labor market to the conditions of the post-industrial society.

Second, a distinctive feature of the emerging economic structure is its social orientation. The

action of global megatrends creates problems, the solution to which often contradicts the laws of economic growth. Except digitalization, which has the potential for technological transformation of the world and promotes economic growth, the established megatrends mark the beginning of the economy's socialization and transition to a society in which sanity *will have to* prevail over greed.

The situation is complicated by another threat, which may soon develop into a global trend. We are talking about the possible end to economic growth. Recall that the growth regime in which the world has been for the last 250–300 years, according to D. North, is “an exception, and stagnation and decline are the rule” [51]. Such famous scientists as R. Lucas [52] and T. Piketty [53] hold to the same view expressing frank doubts about maintaining the growth trend in the long term. A landmark in this direction is the work of R. Heinberg, who summarized the works of economists, politicians, scientists dealing with the problems of functioning and development of the world [54]. In this study, the author argues that society is on the threshold of a new economic reality associated with the achievement of the physical limit of economic growth, on the way of which there are three obstacles: resources, ecology and finance [54, p. 17].

Third, based on the results, it is possible to imagine what the appearance of the future post-industrial society will be. The new opportunities

Table 2. The impact of megatrends on the economic structure

Megatrend	Type of economy	Effect
Demographic transformations	Silver	Social
Ecology	Circular	Social
Digitalization	Robotomics	Economic
Geopolitical inversion	Peer-to-peer	Socio-economic
Wealth, health, knowledge	Spiritual and moral	Social
Source: own compilation.		

³² An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy. Available at: <https://ufm.dk/en/publications/2016/files/an-oecd-horizon-scan-of-megatrends-and-technology-trends-in-the-context-of-future-research-policy.pdf>

that technological progress opens up to the world allow society to move to a fundamentally new stage of evolution, connected, according to the theory of vital resources, with the development of such a vital resource as time [55]. The increase in life expectancy against the background of the release of time due to automation and robotization of production processes suggests that a new round of development will become the era of the socio-technological structure of the “economy of time”, focused on the spiritual and moral development of an individual and the disclosure of their creative potential. Against this background, the post-industrial economy is primarily a struggle for a person’s free time and their leisure, which makes it the *leisure economy* [56]. The above trends in the development of society confirm these provisions. With regard to Russia, the transition to a post-industrial society is complicated by what is happening in the absence of developed industrial sector requiring the government of the country to take preventive actions to reduce possible mass unemployment [57].

In order not to stay a part of new society, it is necessary to start preparing for the transition process today. To do this, in the development strategy of any state including Russia, it is necessary to provide for several principles related to the adaptation, first of all, of the labor market to future changes. These include the following provisions:

1. Technological industries are the basis of the economic development of society, requiring the improvement of the knowledge economy and training of highly qualified specialists including in the field of IT technologies and security. It is through the development of this economic sector that countries get the opportunity to remain technological leaders and actively participate in the formation of a global development strategy.

2. Sectors of education, healthcare, leisure, entertainment, and the social sector are the drivers of the emerging new economy from the employment

position. It is these areas that will ensure not only mass employment, but also the full-fledged development of the leisure economy (including the silver economy), focused on mastering such a resource as time, and on its efficient use.

3. Higher education system is the cornerstone of the emerging society. It is here that the transformations associated with the revision of the structure of training, its quality and effectiveness should begin. The task of the higher education system today is to adapt to the constructed model of the economy and begin forming a new cohort of specialists with a shift in emphasis toward creative professions and the service sector.

Of course, these provisions are rather a kind of guideline and set the vector for further research and development, and help to understand the economic areas on which it is necessary to focus attention in order to survive the transition period with minimal social costs and in the future to extract the maximum possible benefit from the impending transformations.

Conclusion

The global trends of human development, considered in the article, have shown that the world is changing dramatically and the 21st century is inextricably linked with addressing the issues of environmental, political and economic injustice, ignoring which can lead to catastrophic consequences. A new paradigm is already taking shape today, acquiring real features in the form of the directions of the economy formulated in the work. The analysis made it possible to determine the appearance of a new society focused on the development and use of the spiritual and moral potential of mankind. We have revealed that the cornerstone of the emerging economy is its socialization and orientation to the development of such a vital resource as time. From this point of view, the new economy should become *leisure economy* – the next step after the knowledge economy, the development of which will give society

the opportunity to maximize the achievements of technological progress for the benefit of human capital development.

The main task facing countries in connection with the ongoing transformations is to prepare in advance for the upcoming changes. They already need to be taken into account when preparing strategic documents in all sectors and at all levels

of government, especially in the field of education and science, which requires a serious revision of established traditions and reorientation to the needs of the economy. This will make it possible in the future to extract the maximum social and economic effect from the upcoming transformations with minimal costs associated with the transition process.

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Investigating the Approaches to National Innovation Systems Modeling*



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Abstract. The article analyzes some modern approaches to modeling national innovation systems that are presented in scientific literature. We use modern methods for analyzing bibliography and preparing literature reviews: co-occurrence, and the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) method. With the help of this approach we conduct relational analysis of documents by systematizing and arranging keywords into special semantic clusters that reflect interest in modeling national innovation systems. The research focuses on mathematical models of national innovation systems and models that use empirical quantitative data analyzed with the help of various econometric methods based on the Russian specifics of economic development. In this regard, when searching for and analyzing relevant sources, we used the filters “Russian innovation system”, “national innovation system and Russia”. We have revealed that the majority of publications focuses on such aspects as digitalization, neo-industrialization, innovation policy and technology. We identify four directions for modeling national innovation systems: macroeconomic modeling of innovation systems, modeling of growth based on the development of innovation systems, modeling of innovative activity of firms, modeling of institutional factors contributing to the development of innovation systems. The national innovation system is modeled mainly through the use of indicators related to patenting, the volume of exports and the production of innovations. Factors determining the development of national innovation systems in this context include R&D and innovation expenses, investment in technology, education, infrastructure, human resources and the quality of human capital. Conclusions on the analyzed models often do not coincide regarding the role of the state in financing innovations, the role of various elements of the institutional structure of the economy, such as intellectual property rights and mechanisms for their protection, as well as the role of political factors. On the other hand, the conclusions are consistent in terms of the impact of innovation on economic growth and development: we note a positive correlation with indicators reflecting the development of national innovation systems.

Key words: innovation, national innovation system, economic growth, institutional structure, economic policy, Russian innovation system.

Problem statement

Innovations, including the framework in which they are created and implemented, are an important condition of economic development. The creation of innovations largely depends on the level of development of science and technology within an economic order. Traditionally, science and technology are considered as key factors in modern macroeconomic models of economic growth [1; 2]. The development of science and technology in the modern world largely depends on the public policy in the field of science and innovation. Modeling the processes of the influence of science and technology in the context of public policy development is quite

important, because a simplified understanding of the links between science, technology and economic growth can produce negative outcomes [3].

Modern national innovation systems (NIS) are most often considered as a set of institutions and organizations that generate new knowledge and technologies and contribute to their application in production [4]. The innovation system consists of elements and connections that are rooted within national borders and interact in the production, dissemination and use of economically useful knowledge [5]. In research practice, this is embodied in the construction of various formal models of NIS.

In the paper, we analyze how innovation processes are modeled in modern economic literature in the context of various national and institutional features of innovation systems.

Our main focus is on the study of mathematical models of national innovation systems and models using empirical quantitative data analyzed with the help of various econometric methods. In the course of the analysis, we identify and classify various models and approaches to formal modeling and explanation of the functioning of innovation systems; thus, we distinguish four types of them. In this regard, the main goal of our work is to identify main hypotheses of innovation models and their corresponding statistical aggregates for the purpose of studying them using narrative analysis methods. Within the framework of the article, we focus on obtaining “primary” information from the analysis of models for the purposes of formulation and content-related verification by methods of narrative analysis in subsequent works.

Identifying the array of relevant NIS models

Modern scientific literature pays considerable attention to the problems associated with the functioning of NIS. In order to achieve the goal set in this article, we carried out an analysis of NIS modeling using two approaches: co-occurrence and PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which were not previously used together in Russian social sciences. These approaches have been actively used in the social sciences over the past decade, thus, it allows us to streamline and algorithmize the process of analyzing bibliography and preparing a literature review on a particular scientific problem [6; 7; 8].

Co-occurrence method

In order to build visual maps and visualize bibliographic data, we used the co-occurrence method, which allows us to carry out a relational analysis of documents based on the systematization and ordering of key words into special semantic clusters reflecting interest in a particular problem for a selected period. Initially, this method was used for targeted search, later – for evaluation and presentation of research results. Visualization is based on the use of authors’ key words, because authors carefully select them so that they could reflect main concepts of the published works. The method implies the following sequence of actions: 1) search and filtering of literature, removal of duplicates; 2) key word selection and basic statistical analysis; 3) visualization of the key word network; 4) interpretation of clusters [9].

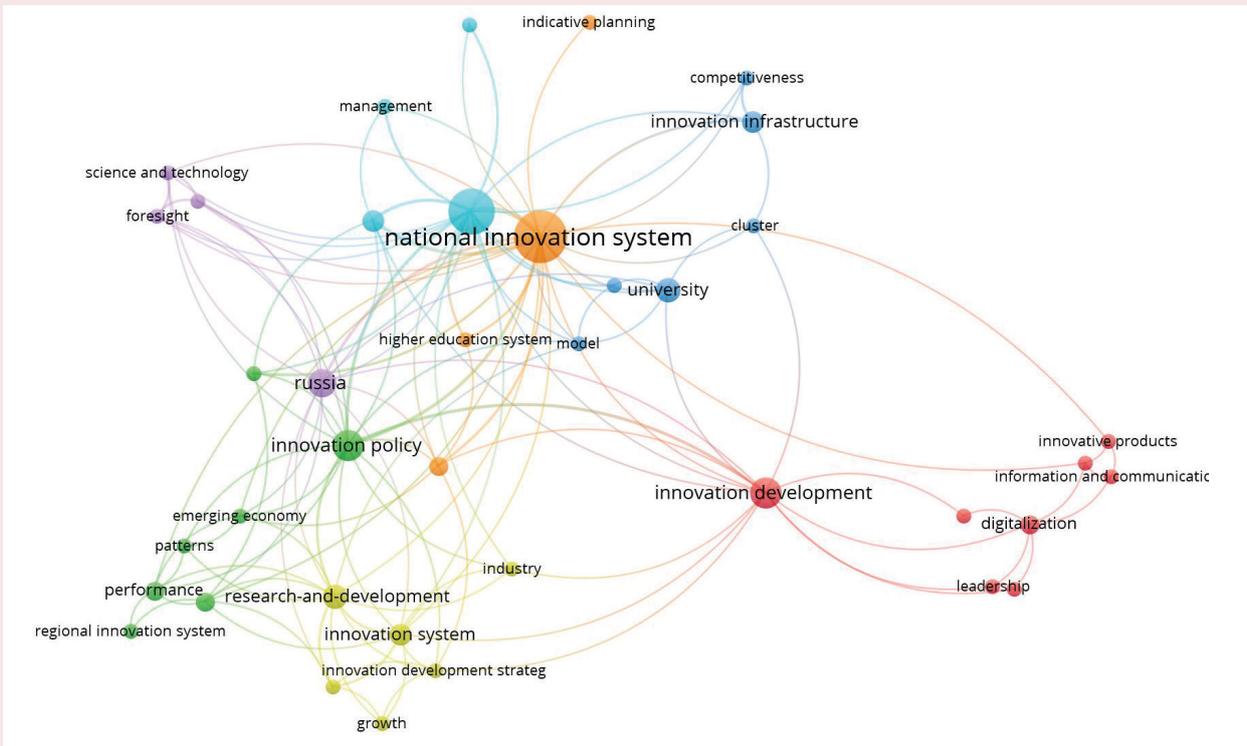
The articles included in the study were identified by searching the Scopus and Web of Science (WOS) databases, which are among the most widely used and recognized academic databases in the world. *Table 1* shows combinations of key words and the initial search results. In Scopus, the search was carried out using the field “Article title, Abstract, Key words”; in WoS, we chose an equivalent field with the name “Topic”. The search was carried out without setting particular limits for the publication date.

The selected publications belong to the research field of several sciences, with most of them in Economics, Econometrics and Finance; Business, Management and Accounting; and Social Sciences. *Figure 1* shows the results of analysis of key words in WoS, based on the number of matches of at least two key words, which means the number of publications

Table 1. Key words and initial search results

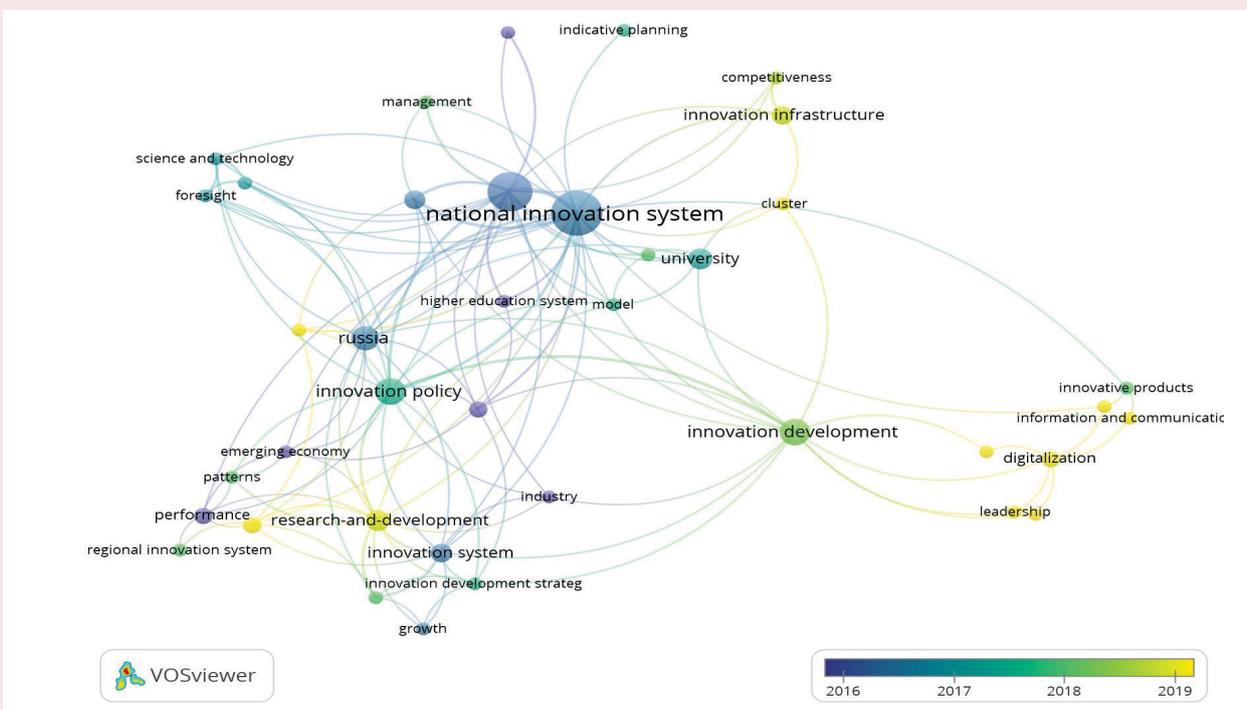
Key words	WoS	Scopus
Russian innovation system	9	19
National innovation system and Russia	54	87
Source: own compilation on the basis of own research findings.		

Figure 1. Key word clustering (WoS)



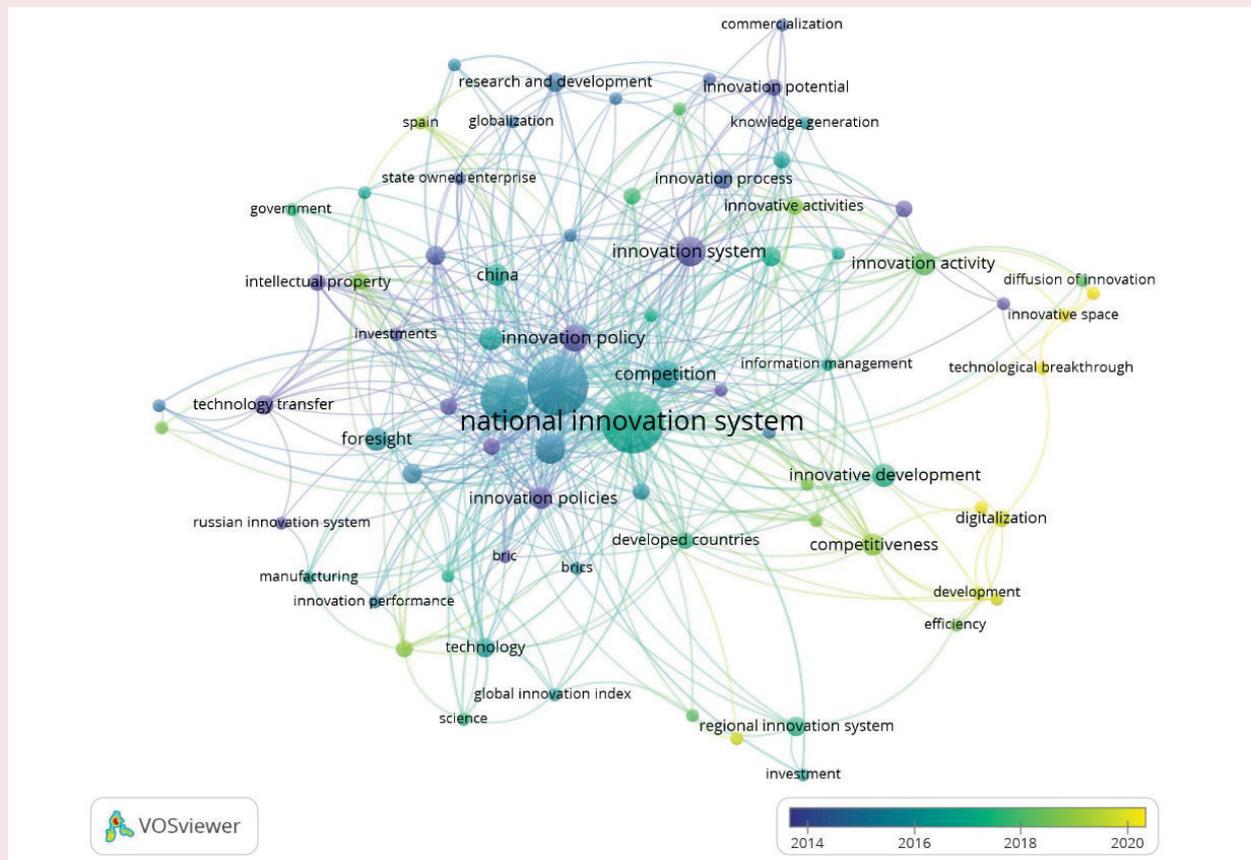
Source: own compilation on the basis of own research findings.

Figure 2. Occurrence of key words by year (WoS)



Source: own compilation on the basis of own research findings.

Figure 4. Occurrence of key words by year (Scopus)



Source: own compilation on the basis of own research findings.

According to Figures 1 and 3, the terms “national innovation system”, “innovation”, “innovation development” and “innovation policy” are most common in the WoS and Scopus databases. Figures 2 and 4 show the evolution in research terminology. The terms “innovation infrastructure”, “leadership”, “digitalization”, “knowledge spillover” are highlighted in yellow, which indicates an increase in their usage in recent publications.

The visual analysis of the bibliographic data helped us clarify key points for the next stage of the study, namely, the application of the PRISMA method.

PRISMA method

We use the PRISMA method to conduct a systematic study of the literature on the chosen

topic. The PRISMA method is widely used in many scientific fields, but it has become especially widespread in medicine. In the social sciences, the PRISMA method is applied to a wide range of issues, since it represents a systematic review aimed at identifying, evaluating and interpreting the results of research that is relevant and related to a specific topic to be studied. The implementation of the corresponding procedure implies the sequence of several steps: identification of sources, identification and removal of duplicates, screening and assessment of eligibility [10].

Step 1 – identification of the sources. At this stage, we searched for works in several science citation databases: the international databases Web of Science and Scopus, as well as the Russian

Table 2. Search queries to science citation databases

Database	Search query	Search restriction criteria
Web of Science	("Russian innovation system") OR ("National innovation system" and Russia)	Absent
Scopus	("Russian innovation system") OR ("National innovation system" and Russia)	Absent
Elibrary	("Russian innovation system") OR ("National innovation system") OR (Национальная инновационная система) OR (Российская инновационная система)	Search in: the title of the publication. Type of publication: journal articles, dissertations, books, conference materials. Subject: no restrictions. Authors: no restrictions. Journals: no restrictions. Parameters: search based on morphology. Years of publication: no restrictions. Received: for all time
Source: own compilation on the basis of own research findings.		

database of the national electronic library eLibrary. The basis consisted of the following key queries "Russian innovation system", "National innovation system" and Russia; since eLibrary contains a large number of Russian-language publications, these queries were supplemented with their translated counterparts ("национальная инновационная система" and "российская инновационная система"). We did not apply restriction criteria at the identification stage for the Scopus and Web of Science databases; the following advanced search parameters were set for eLibrary: inclusion of a key query in the title of publication, publication type – articles in journals, dissertations, books, conference materials. Search queries and exclusion parameters are formulated in *Table 2*.

This step allowed us to identify 1,379 scientific sources. Additionally, other publications identified during the search in the above databases, as well as in the Google Scholar system, were included – this increased the total research base by 232 units. In total, 1,611 publications were selected at the identification stage.

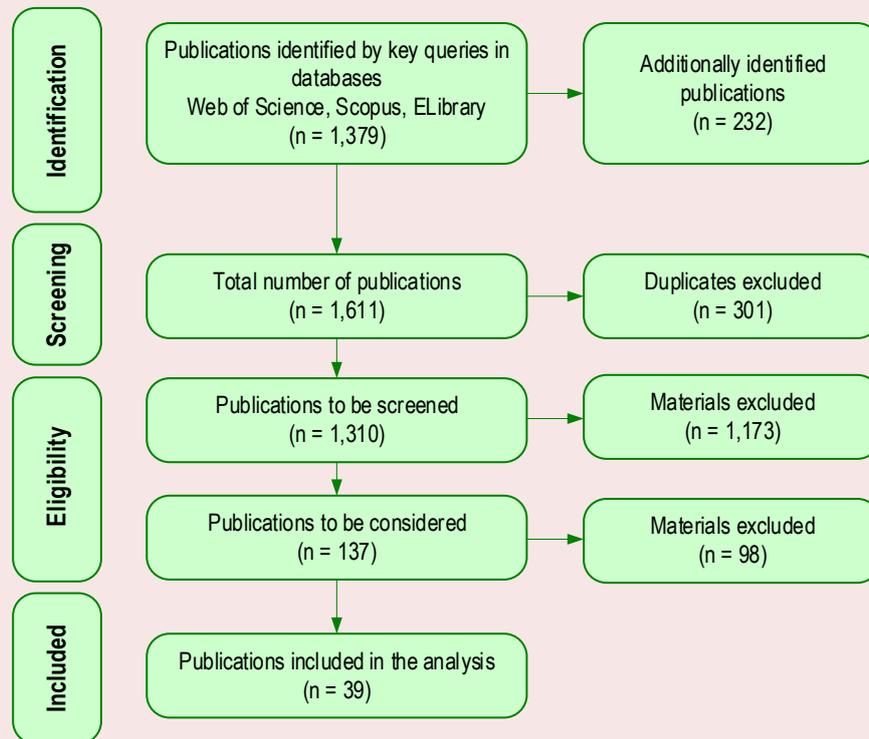
Step 2 – identifying and deleting duplicates. In the course of checking the research base for duplicates, 301 works were identified and deleted, therefore, 1,310 sources remained for further consideration.

Step 3 – screening. This stage includes checking publications for compliance with the topic. We excluded materials that did not meet the basic inclusion criteria, according to which the topic of the work relates to the study of national innovation systems, or the work contains a model of the national innovation system. We also excluded materials that cannot be considered in full text either because there is no access to them or the publications are in languages other than Russian and English. This allowed us to discard another 1,173 sources, leaving only 137 for further consideration. Thus, already at this stage, only 8.5% of the works from the initial sample were submitted for analysis.

Step 4 – assessment of eligibility. Verification involves identifying scientific sources that contain mathematical models of national innovation systems. Consequently, those works that contain only a conceptual description of NIS, a simple description of relevant statistics, that is, do not offer a specific formal analysis, were subject to exclusion. This reduced the original sample by another 88 sources. In the future, using qualitative analysis, we excluded ten publications that did not meet the search criteria. In total, 39 papers were selected for final consideration – 2.4% of the initial number of publications.

The PRISMA flowchart is shown in *Figure 5*.

Figure 5. PRISMA flowchart



Source: own compilation on the basis of own research findings.

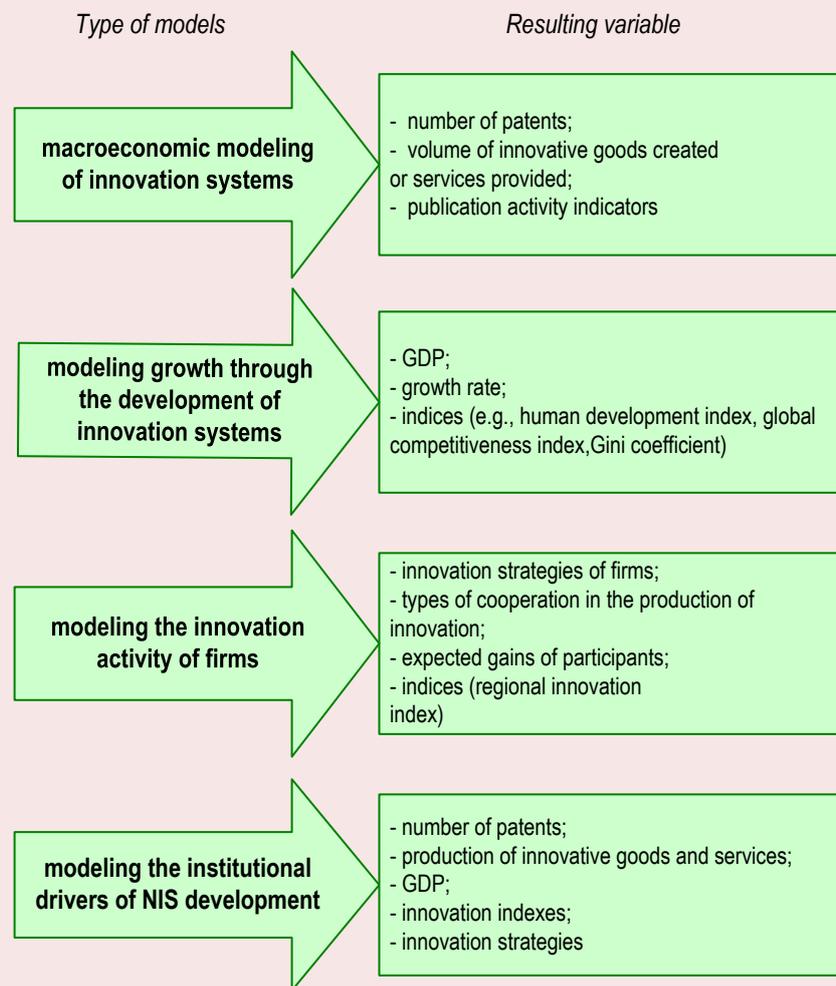
Typology of NIS models

In the course of a content-related analysis of the selected scientific literature, we classified models into four types based on the generality of conclusions: macroeconomic modeling of innovation systems, modeling of growth due to the development of innovation systems, modeling of innovation activity of firms, modeling of institutional drivers of development of innovation systems (*Fig. 6*).

Each of the selected varieties includes many approaches to NIS modeling. Thus, macroeconomic modeling of innovation systems is often carried out using patenting indicators (the number of registered patents, filed applications), production and economic indicators (output and export of high-tech products, GDP, investment and R&D expenditures), publication activity indicators (the number of research papers). When modeling growth

due to the development of innovation systems, the latter are reflected as indicators of GDP and its derivatives (growth rates, labor productivity, GDP per capita) and as global competitiveness indices, HDI, Gini coefficient. Modeling of innovation activity of firms is focused on studying the features of innovation activity of actors at the micro-level; therefore, first of all, what is taken into account includes innovation strategies of firms, types of their cooperation in the framework of creation of innovation, the expectation of participants' gains and their perception of obstacles, as well as the corresponding indices. Regarding the institutional factors in innovation systems, it is useful to take into consideration the previously mentioned macro-indicators of patenting, production, GDP, innovation indices, and micro-level indicators, in particular innovation strategies of organizations.

Figure 6. Typology of NIS models



Source: own compilation on the basis of own research findings.

This classification helps us typologize the sets of approaches and variables that are used in the scientific literature. In further research, this typology can be supplemented and expanded by increasing the volume of analyzed information and conducting interdisciplinary research in this direction.

Macroeconomic modeling of innovation systems

The number of patents (filed by residents and filed on the territory of the country; the number of approved or registered applications) is most often used as the resulting proxy variables when modeling NIS. In such cases, authors note that this variable

positively depends on R&D expenditures in general, including business and/or government expenditures on R&D, business expenditures on innovation, as well as investment indicators of various kinds: investment in innovation, for example supercomputers, investment in technology, general investment in education and foreign direct investment [11–18].

It is noteworthy that some researchers find that the production of innovation is carried out effectively not only or even not so much by large research centers as by small ones. Thus, J.K. Perret writes that regions with major and

advanced research centers are less efficient than those with small research institutes, since in the former there is a negative scale effect from hiring more researchers [12]. This idea is confirmed by other works, according to which small towns can demonstrate scientific achievements no less than or even superior to those in large agglomerations [19; 20]. The small size of the region is not an obstacle to effective innovation; moreover, authors note that regions with low R&D indicators can become effective, because patents can be the result of people's pure creativity not related to the systematic work of research institutes [21]. The conclusion about individual innovation creation activity is consistent with another study, the author of which concludes that individual inventors register more patents than domestic and foreign companies [22].

A popular variable reflecting NIS is the volume of innovative goods or services created, that is, the volume of high-tech exports or production and sales of innovative goods (at the level of firms). In various models, this variable shows dependence on a variety of factors characterizing human capital (the number and structure of the workforce and personnel, the level of education), infrastructure (in terms of the use of computers), innovation activity (production of innovative goods, expenditures on R&D, science, investment in innovation, the number of enterprises engaged in the creation of knowledge), institutional structure (government, business conditions), financing (volume of lending) [15; 23–27].

Publication activity indicators (the number of published research papers, citation indicators) as a way of reflecting the functioning of NIS are used less commonly. The determinants here are generally the same factors as in the previously mentioned models: human capital (number of researchers, level of education), investments (R&D expenditures, foreign direct investment, education expenditures), indicators of innovation activity (patent registration, import of high-tech goods) [19; 28].

Modeling growth through the development of innovation systems

GDP (the total indicator or in terms of per capita, or growth rates) is a traditional indicator of economic growth. Econometric models reflecting the impact of NIS on GDP show that there is a positive correlation between the indicators of production of innovative goods and services (value added of knowledge-intensive industries, cost of high-tech exports), innovation activity (number of patents, publication activity), investment (R&D expenditures, science financing, foreign direct investment), human capital development (education indicators – education costs, number of students, number of research staff), infrastructure (Internet access, cellular communications), financing and taxation (lending, tax rates) and economic growth [29–38].

When it comes to attempts to model economic development, then there are significantly fewer publications on this topic. As a rule, the proxy variables here are represented by combinations of some factors reflecting economic development, or various indices, for example, the human development index, the Gini coefficient. However, the variables affecting it are generally the same as for economic growth [39; 40].

Historically, in economic theory, economic development is associated with factors and variables that are difficult to quantify, in particular, the state of the institutional structure or the quality of economic policy. Due to the complexity of including such institutional factors in the analysis using formal modeling, it is necessary to supplement mathematical modeling with conceptual modeling using qualitative methods. As noted by the Nobel laureate R. Shiller, in the framework of narrative economics, econometric modeling can be supplemented with qualitative research [41].

Modeling the innovation activity of firms

The models describing innovation activity at the micro-level are very fragmented. This is probably

due to the fact that the data for such a study were obtained in the process of using mixed methods: surveys and questionnaires, which forms a heterogeneous sample of initial data, and, therefore, various aspects studied in publications.

First of all, the innovation activity of firms is associated with the enterprise itself. As Bengt-ke Lundvall notes, large enterprises in high-tech industries with their own innovation strategies work more intensively in relation to the production of innovations; it is also indicated here that those enterprises that produce customized products are more likely to be intensive innovators [42; 43]. The researchers also highlight the fact that medium and large enterprises focused on global and national markets are involved in the process of innovation interaction to a greater extent. In general, the increase in R&D expenses on the part of business is associated with the cooperation of the former with relevant organizations, while state-owned enterprises more often interact with universities [44].

D.A. Gordeev and V.V. Akberdina propose another approach based on the expected benefits from participation in innovation processes. Their conclusions, however, are not at variance with the previous ones: the behavior of organizations is determined by a set of regulatory and organizational and managerial factors, that is, the conditions and goals of this activity, as well as interaction with the environment represented by state actors, science and entrepreneurship, and the corresponding restrictions [45]. In general, the importance of the state as one of the parties to ensuring political conditions that are taken into account by an individual when making decisions regarding investments (in this context, as the development of technology transfer) is emphasized in the work of B.E. Odintsov, in which the researcher points out that investors' interest increases with external political and economic stabilization, as well as stabilization of the federal level of government [46].

The availability and localization of resources are also important in modeling innovation activity. In addition, financing plays a key role for enterprises, unlike institutional representatives who find that the education factor is more important for innovation development [47]. A broader view of the obstacles to innovation from the point of view of firms involves taking into account additionally such factors as unfavorable environmental conditions, detachment from innovation interaction, intra-company factors (including the problem of human capital), high risks, flaws in infrastructure [48].

The environment in which a company is functioning also plays an important role in terms of innovation activity. For example, the interaction between firms in an innovation environment and the exchange of knowledge directly depend on the intensity of the firm's R&D activities and the system of protection of its property rights [49]. As if to prove this idea, it should be noted that a firm existing in both the sectoral and regional environment is affected from both sides, however, the sectoral innovation system is associated with the intensive growth of the enterprise, while the regional innovation system contributes to the extensive growth of the company [50].

Modeling institutional drivers of innovation systems development

It is noteworthy that even with the relative homogeneity of approaches to the reflection of NIS in models, the conclusions obtained from empirical data vary greatly even with respect to the basic aspects that are considered determinants of innovation activity.

Financing is one of the key aspects mentioned in determining the drivers of innovation performance [51]. As a rule, it is assumed that government spending has a positive impact on NIS, and many models show that this is true: government spending on research and development is an indicator of the innovation system, which has a positive effect on economic growth [31]; the same relationship exists

between budget allocations for science and GDP [37]. However, not all points are unambiguous. Governmental support and financing are not significant with regard to promotion of cooperation between science and industry, it is not affected by either targeted or general measures (taxes, interest rates); only special measures of network support (technology platforms, clusters) prove effective [44]. A similar idea can be traced in another article [25]: the regression model has revealed that government spending on R&D does not have a significant impact on high-tech exports – an important indicator of the national innovation system. Another study shows that public financing is insignificant in the case of Russia, that is, it does not have a significant impact on the openness of innovation activity or the exchange of its results [49].

The question of the need and role of government spending seems to be difficult, given that firms tend to note just the need for resources as a key factor affecting their activities in the field of innovation [47], and the lack of financial resources and government support as one of the main obstacles to these activities [48].

Another factor influencing innovation activity is the system of property rights protection. It is obvious that actors have more incentives to create new goods and services when there are guarantees that their innovations are protected from copying, expropriation, etc. Nevertheless, when studying findings of the studies involving this aspect, one may encounter somewhat heterogeneous conclusions. Although the complexity of the property rights protection system has a positive effect on the involvement of firms in the exchange of knowledge, at the same time we should note that this aspect requires more detailed research; moreover, it was revealed that a significant number of enterprises recognize this same factor as an obstacle to the exchange of technological achievements [49]. On the other hand, there is evidence of a significant

and positive impact of the property rights protection system on the processes of cooperation between industry and the academia, and both formal and informal instruments are important in this regard [44]. At the same time, modeling the dependence of labor productivity on a number of indicators characterizing the openness of the national innovation system has revealed such factor as the cost of using intellectual property does not have a significant impact on the regressand [38].

The importance of institutional factors for innovation is also investigated in the context of ownership forms that promote or hinder innovation activity. The failures of the national innovation policy in terms of non-fulfillment of the function of creating, storing, distributing and economically applying knowledge are caused by the distortion of the motivation of actors due to the flaws in the institutional structure, for example, in institutions related to intellectual property [52].

Another contradiction is observed regarding the question of assessing the importance of the institutional structure in the context of national innovation systems and their impact on economic growth. As a rule, it is assumed that institutions are important for economic development [53; 54; 55].

It is also logical to assume that developed institutions have a positive impact on innovation processes. On the one hand, some empirical studies confirm this fact. Thus, S. Zemtsov and M. Kotsemir come to the conclusion that institutional conditions provide the best opportunities for interaction between actors in the innovation process [21]. On the other hand, some models show that the institutional component is insignificant [36; 40]. S.M. Pyastolov in his article demonstrates a model of the impact of various factors on the index of innovation output, where the coefficient for a variable of institutions takes a negative value [56].

Conclusion

The relational analysis of publications that we have conducted allows us to present a picture of research devoted to the modeling of innovation systems. The study of innovation systems is within the research field of several sciences, with most of them in economics, econometrics and finance, business, management and accounting, and the social sciences. Having analyzed scientometric indicators, we reveal that in recent years there has been an increase in publications on this topic, accompanied by an increase in references related to the topic of key words in scientific publications.

Studies of national innovation systems in modern economic theory focus on the mechanisms, quantitative results, and indicators of the functioning of organizations. Qualitative analysis and interpretation of the articles helped us to identify and establish four main aspects of national innovation systems modeling: on the one hand, NIS macro-models and modeling economic growth

through the development of innovation systems, and on the other hand – modeling institutional drivers of innovation systems development and modeling the innovation activity of firms.

The analysis of variables of the above types of models is important for understanding formal modeling, an essential aspect in the study of national innovation systems. The variables of the considered types of models will be used in the future to organize the collection and analysis of qualitative data within the framework of narrative economics, the newest scientific direction. In this regard, the results obtained in the course of our work are necessary when formulating queries in the databases of mass media, conducting content analysis, and formulating questions in the guides of in-depth interviews. Conducting qualitative research into the Russian innovation system based on the analysis of narratives allows, along with its formal modeling, to gain a deeper understanding of the processes in the field of creation and implementation of innovation.

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The Concept for Corporate Demographic Policy of Russian Enterprises in the Framework of Corporate Social Responsibility*



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Abstract. National priorities in the development of Russian society in the field of demography are related to population reproduction, health preservation, decrease in working-age mortality, increase in life expectancy, etc., and also correlate strategically with the effective functioning of business. This brings to the fore the need to develop, implement and elaborate on corporate social policy in general and corporate demographic policy in particular. The aim of the study is to analyze social policy pursued by major Russian corporations (PAO Severstal, Magnitogorsk Iron & Steel Works PJSC, Gazprom Neft PJSC, PJSC Lukoil, JSC Russian Railways, PJSC PhosAgro, PJSC Acron) and substantiate the concept for corporate demographic policy of enterprises. We consider prerequisites for the establishment and implementation of corporate demographic policy in Russian society. We have found that at the present stage of its development, corporate social responsibility is most often reduced to cash payments and participation of enterprises in individual social projects. The article analyzes social policy practices that Russian companies are implementing and that are directly related to demographic issues (childcare allowances, employee benefits, health resort treatment, etc.). We look into the approaches to understanding corporate demographic policy and its effectiveness; we show the benefits of implementing corporate demographic policy at Russian enterprises. Such benefits include promotion of business reputation, reduction in social tension, participation of enterprises in addressing demographic development issues, etc. According to some studies, the introduction of corporate health promotion programs can reduce disability losses from a number of causes by almost 30%. The practical significance and scientific novelty of our research consists in the development of a concept for corporate demographic policy of Russian enterprises, definition of its targets, implementation mechanisms and substantiation of the expected results, which consist in enhancing the effectiveness of state demographic policy as a whole and improving the results of implementation of corporate programs.

Key words: demography, corporate demographic policy, corporate social responsibility, enterprises, concept.

Introduction

Currently, Russian society is facing a number of demographic and social issues: despite the expanded governmental support programs, birth rates are decreasing, Russia is experiencing natural population decline, childbirth causes deterioration in the standard of living. These trends pose a threat to Russia's demographic security and arouse concern among scientists, experts, politicians, and employers.

In today's unfavorable demographic conditions, finding a solution to the issues concerning population reproduction and human capital development is becoming the most important task at all levels of government. An active pro-natalist policy is being pursued at the governmental level. However, governmental measures alone are not

enough to solve this problem. It is important to increase personal responsibility of citizens regarding health preservation issues and to engage business entities in this field with the help of the tools for enhancing social responsibility. We think that one of the effective tools will be the adoption of national level documents approving the goals and principles of corporate demographic policy. Being an integral part of social responsibility, it can compensate for the insufficient state assistance provided to families with children and strengthen the support provided at the macro-level in the field of parenthood. At the same time, the state can boost corporate demographic policy through a set of incentives (favorable tax regime; subsidies and benefits; granting preferences in obtaining government orders, etc.).

Theoretical and methodological foundations of the research

The neo-institutional approach assumes that “organizations are structured by the phenomena of their environment and are usually isomorphic to it” [1]. Organizations and the environment in which they function are interconnected, exchange processes occur between them; this leads to a certain mutual compliance of organizations and the environment.

P.J. Dimaggio and W.W. Powell consider three mechanisms of institutional isomorphic changes: coercive, mimetic, and normative isomorphism [2]. These mechanisms can promote the dissemination of the practices for support of parenthood among employees of Russian organizations. The mechanism of coercive isomorphism can be launched by the government that pursues an active pro-natalist policy and is interested in increasing the level of its impact on the population. Thus, in Russia, tax regulations have benefits for employers who provide various forms of assistance to employees with children (for example, the expenses that the employer pays for the work break provided to the mother to feed her child are taken into account in the profit tax, as well as the services for the organization of tourism, resort treatment and recreation in Russia for the children of employees¹.

Scientists say that corporate social policy has a solid economic substantiation – corporations receive numerous benefits if they do the work for the long run rather than just focus on their own short-term profit [3; 4]. On the other hand, some critics argue that corporate social responsibility leads enterprises away from the fundamental economic role of business [5–8]. The influence of

corporate social policy on society, in particular, on the residents of the territory where the enterprises are located, is questioned.

Despite an ongoing discussion on the matter, we believe that corporate social policy has a positive impact on employees. We base our opinion, among other things, on the results of E. Mayo’s experiments, which proved that socio-psychological factors have a stronger impact on the productivity of workers than physical ones. The very possibility of viewing an enterprise as a subject that implements demographic policy is based on the fact that “a business, as a subject of demand for existing and future human capital, shares the responsibility for its preservation, development and replenishment with the government” [9]. Corporate demographic policy as part of the company’s social policy shows, first of all, the attention of the company’s management to its employees, to the fact that they have children; it shows that the company is also interested in these children getting everything they need for their development. In our opinion, the loyalty of employees to their enterprise and, as a result, the effectiveness of their professional work, will increase if employees know that their superiors are interested in them not only because they perform certain work, but also because they are people who have children. Demographic issues also include employers’ concern for the health of their employees. According to a number of studies, the introduction of corporate health promotion programs can reduce disability from a number of causes by almost 30%, and in some companies even more².

The interest of enterprises in the implementation of social policy is also based on the fact that, when they assume part of the state’s obligations toward the population, they receive governmental support

¹ Tax Code of the Russian Federation (Part Two, dated August 5, 2000, no. 117-FZ) (with amendments and supplements, entered into force as of November 15, 2020). Available at: <https://base.garant.ru/10900200/> (accessed: October 10, 2021).

² The Ministry of Health believes that corporate programs can reduce up to 30% of days away from work. Available at: <https://tass.ru/nacionalnye-proekty/6778718> (accessed: October 10, 2021).

for their interests. For example, this may manifest itself in obtaining preferential loans from state-owned banks, state regulation of the actions of natural monopolies, support of the enterprise with state orders, protection from external suppliers (imports), reduction of the tax burden, etc.

The international experience of interaction between government and business structures³ in the areas promoting social and socio-economic development of countries goes through the development of the National Agenda [10]. The development of corporate social responsibility (CSR) is regulated by authorities and management using a whole range of tools, from the establishment of ministerial posts on social responsibility (the UK), special legislation on the promotion of CSR (Belgium, Switzerland, Canada) to specific tools for promoting innovation and addressing social issues (Italy, Norway, Poland, Croatia, France). In this direction, it is worth mentioning the experience of the People's Republic of China, which has developed state documents regulating the principles of social responsibility, "Recommended standards of CSR for Chinese corporations", etc.

In addition, social projects have a significant impact on the perception of enterprises in society and their reputation. Expert calculations show that there is a direct positive correlation between the socially-oriented work of an enterprise for the local community and the reputation of this enterprise. For example, an analysis of the activities of 100 German companies confirmed a positive relationship between investments in personnel development and the company's stock price [11; 12].

An analysis of international experience provides information about the most successful and effective forms and areas of development of corporate social responsibility. However, using the experience of such

programs requires taking into account historical features of countries, their traditions and the level of socio-economic and political development. Speaking about social responsibility in Russia, we cannot but recall the glorious traditions of patronage of the 19th and the early 20th century. At the same time, over the past half a century and more, there has been a noticeable evolution of the social responsibility of Russian business and the economic interaction of authorities and business structures. The 1960s and 1980s witnessed the development of backbone enterprises that formed and serviced the social infrastructure in their regions, creating factory canteens, dachas, polyclinics, health resorts, suburban children's health camps, departmental housing, dormitories for workers. In the early 1990s, a radical change in social and economic relations led to a total reduction in the social responsibility of economic entities. The latter hastily got rid of their social facilities (or transferred them to regions and municipalities), reducing social obligations to a minimum. The solution of social issues was handed over to the government. Stabilization of the socio-economic situation in the 2000s once again shifted the focus toward the development of corporate social responsibility, which today is becoming a factor reflecting economic efficiency and stability in the long term.

In modern Russia, institutional conditions are being formed that regulate the interaction of government and business, the formation and development of social responsibility; legislative acts regulating standards are being adopted. Such documents include GOST R 54934-2012/OHSAS 18001:2007 – it is the National Standard of the Russian Federation, which establishes requirements for the occupational health and safety management systems (BTiOZ) at enterprises. It is intended for use by organizations of any type and size, regardless of differences in geographical, cultural and social conditions.

Employee support measures and the forms of

³ Four emerging trends in corporate social responsibility. Available at: http://www.mallenbaker.net/csr/page.php?Story_ID=2747 (accessed: October 10, 2021).

corporate social responsibility have changed significantly. Companies no longer seek to have subordinate social institutions (hospitals, kindergartens, summer recreation camps or health resorts), that is, they do not intend to form a social environment. Most often, support measures are reduced to cash payments and participation in individual projects [13].

For the purposes of the study, we analyzed social policy of seven large Russian corporations: PAO Severstal, Magnitogorsk Iron & Steel Works PJSC, Gazprom Neft PJSC, PJSC Lukoil, JSC Russian Railways, PJSC PhosAgro, PJSC Acron. The analysis of the support measures provided by the companies to employees and their families was

carried out on the basis of the data published in open access corporate reports.

Findings of the corporate social policy analysis

According to the results of the analysis of the social policy of Russian corporations, each of the companies under consideration provides a fairly wide range of social support measures for its employees (*Tab. 1*), their families (*Tab. 2*), veterans and pensioners, focusing on the specifics of activity and established traditions. At the same time, the accounting documentation of enterprises indicates that a small part of companies have departmental social institutions. Most of the companies prefer, as we mentioned above, to pay partial compensation for the social services provided to employees and

Table 1. Support measures provided by companies to their employees

Company	Support measures
PAO Severstal	Treatment of employees at health resorts and health-and-wellness centers
Magnitogorsk Iron & Steel Works PJSC	Life and health insurance, treatment and medical care; providing the opportunity for improving the living conditions of employees
Gazprom Neft PJSC	Voluntary medical insurance; staff training and development; occupational safety and health; payment for the treatment of employees at health resorts, paying for membership in health groups, corporate discounts for the purchase of passes to sports clubs; housing program; sports and cultural events
PJSC Lukoil	Occupational safety and health; voluntary health insurance; support for women and families with children; housing programs; accident insurance; staff training and development
JSC Russian Railways	Social protection of women; health and wellness; voluntary medical insurance; physical culture and sports; culture; financial assistance in special cases; housing policy; free travel for employees; training and staff development; guarantees and benefits when an employee is released
PJSC PhosAgro	Health and recreation; improvement of working conditions; organization of cultural events
PJSC Acron	Social package for employees
Compiled according to: JSC Russian Railways 2020 Annual Report. Available at: https://company.rzd.ru/api/media/resources/1734835?action=download ; PJSC Acron 2020 Annual Report. Available at: https://www.acron.ru/investors/financial-statements/?brand=1988&type=178&year=2020 ; PJSC Acron 2019 Annual Report. Available at: https://www.acron.ru/investors/financial-statements/?brand=1988&type=178&year=2019 ; PJSC Acron 2018 Annual Report. Available at: https://www.acron.ru/investors/financial-statements/?brand=1988&type=178&year=2018 ; PJSC Lukoil 2019 Annual Report. Available at: https://lukoil.ru/FileSystem/9/546178.pdf ; PJSC Lukoil 2020 Annual Report. Available at: https://lukoil.ru/FileSystem/9/551394.pdf ; Magnitogorsk Iron & Steel Works PJSC 2020 Annual Report. Available at: http://www.mmk.ru/for_investor/annual_reports/ ; PAO Severstal 2020 Annual Report. Available at: https://www.severstal.com/rus/ir/results_reports/annual_reports/ ; PJSC PhosAgro 2020 Integrated Annual Report. Available at: https://www.phosagro.ru/investors/reports/year/ ; JSC Russian Railways 2018 Corporate Social Report. Available at: https://company.rzd.ru/api/media/resources/1581145?action=download ; JSC Russian Railways 2019 Corporate Social Report. Available at: https://company.rzd.ru/api/media/resources/1635554?action=download ; Gazprom Group's Sustainability Report 2020. Available at: https://www.gazprom.ru/f/posts/57/982072/sustainability-report-ru-2020.pdf ; Gazprom Group's Sustainability Report 2019. Available at: https://www.gazprom.ru/f/posts/77/885487/sustainability-report-rus-2019.pdf ; Gazprom Group's Sustainability Report 2018. Available at: https://www.gazprom.ru/f/posts/01/851439/sustainability-report-rus-2018.pdf ; Sustainability Report of LUKOIL Group for 2018. Available at: https://lukoil.ru/FileSystem/9/504838.pdf ; Sustainability Report of LUKOIL Group for 2019. Available at: https://lukoil.ru/FileSystem/9/554309.pdf ; Sustainability Report of LUKOIL Group for 2020. Available at: https://lukoil.ru/FileSystem/9/555493.pdf ; PAO Severstal 2020 Sustainability Report. Available at: https://www.severstal.com/rus/sustainable-development/documents/reports ; Magnitogorsk Iron & Steel Works PJSC Sustainability Report for 2019. Available at: http://www.mmk.ru/for_investor/annual_reports/reports_sustainable_development/ ; Portal on accounting, taxes and auditing in Russia Audit-it.ru. Available at: https://www.audit-it.ru/	

their families. For example, Gazprom PJSC has preserved a network of departmental health-and-wellness and health resort institutions. It provides voluntary medical insurance (VMI) policies not only for employees, but also for their family members. Certain types of support, benefits and guarantees are provided to employees of subsidiaries located in the Far North and equivalent areas, young professionals, employees with large families, and employees with disabled children.

JSC Russian Railways also has a network of medical (173 hospitals and polyclinics) and health facilities (84 health resorts, health-and-wellness facilities and recreation centers), 80 children's summer camps, sports (more than 50) and cultural (more than 40) facilities. The company provides employees, their family members and pensioners with a social package under a collective agreement, which includes not only basic social guarantees, but also a range of VMI services and additional benefits. The company compensates from 50 to 90% of the cost of trip vouchers for employees, their family members and non-working pensioners. Among

other things, the company provides additional financial assistance for the birth of a child, a child care allowance, and insurance payments in the event of the death of its employee.

PAO Severstal allocates financial assistance in the form of cash payments in the total amount of 170 million rubles to employees for their treatment at health resorts, provides employees' children with recreation at children's health camps, and if an employee has a family, additional cash payments and loans are provided: for the birth of a child (3,000 rubles), financial assistance due to a difficult life situation (up to 15,000 rubles), etc. A corporate pension program has been developed for people of retirement age, i.e. employees who have fulfilled a number of conditions, after retirement, are assigned monthly financial allowance at the expense of the employer, the amount of which depends on the length of service in the company. For non-working pensioners, the company provides separate measures of social support such as health vouchers to a health resort, one-time payments in connection with anniversaries and holidays, etc.

Table 2. Support measures provided by companies to their employees' children and families

Company	Support for employees' children	Support for employees' families	Support for pensioners
PAO Severstal	Treatment of employees' children in summer camps and health resorts	Support for employees' families in the form of financial assistance and targeted loans	Corporate pension program, social support measures for non-working pensioners
Magnitogorsk Iron & Steel Works PJSC	Treatment of employees' children in summer recreation camps and wellness centers	Rehabilitation treatment of employees and their family members at health resorts and wellness centers, support for large families and motherhood; promotion of birth rate	Support for unemployed pensioners and persons with disabilities
Gazprom Neft PJSC	Voluntary health insurance* Sports and cultural events*		Corporate pension program; voluntary health insurance
PJSC Lukoil	Support for families with children*		Non-state pension provision
JSC Russian Railways	Children's health improvement; free-of-charge travel for children under 18 years of age; insurance of employees' children from accidents during their stay in children's health camps	Health improvement for employees and their family members; physical culture and sports	Healthcare and wellness; corporate pension program
PJSC PhosAgro	"PhosAgro classes" and "PhosAgro school"	Corporate housing program	Social guarantees
PJSC Acron	Support for families with children*		Support for pensioners
* The companies do not divide support for children and support for families into separate categories. Compiled according to annual reports of the companies.			

PJSC Acron reduces its social policy to individual projects and targeted financial compensation of social services and benefits. Thus, the company allocates funds for medical treatment and sports events for its employees; cultural events are organized annually, sports grounds are rented. Payments are provided at the birth of a child, for children's leisure and joint activities of parents and children; part of the cost of vouchers to children's health centers is compensated. Non-working pensioners can visit polyclinics, sports and cultural centers on the same conditions as the company's employees. The company provides special benefits for young professionals: financial assistance in connection with marriage, paid study leave, organization of education programs, trainings, sports and leisure activities, partially reimbursed bank interest rate on mortgage loans, etc.

The presented range of social support measures is diverse and multidirectional. At the same time, the materials of open-access reports suggest that companies are careful with regard to spending money on the social component. Calculations have shown that in most corporations, annual social support expenditures per employee did not exceed 100 thousand rubles, and they decreased significantly under the pandemic (*Tab. 3*).

In 2020, in the corporations under consideration, expenditures on social policy ranged from 1 to 25% of their net profit. In PAO Severstal

and PJSC PhosAgro, such items of expenditure accounted for 0.99 and 2.1%, respectively. The share of social expenditures is slightly higher among the companies of Gazprom Neft PJSC and PJSC Acron (25.03 and 11.43%, respectively). JSC Russian Railways in 2020 allocated more than 40% of payments (28.5 billion rubles) to ensure the safety and health of workers, which is 20% more than in 2018.

On the other hand, according to the analysis of the orientation of social expenditures of enterprises we see that they pay insufficient attention to the goals of demographic policy; therefore, companies have opportunities to expand social support for employees in this direction.

The approach suggesting the possibility and expediency of considering enterprises as actors of demographic policy is extremely new to the Russian economy. In Russia, there is a widespread belief that the number of children in a family is the family's "own business". However, the state's attention to these issues in recent years suggests that children are needed not only by the family. Indeed, every child is a future participant in the labor market, a future consumer of goods and services, a future taxpayer. A business focused on effective work in the long term can find strategically important to pursue a social policy aimed not only at stimulating professional work, but also at supporting employees in performing their parental functions.

Table 3. Social expenditures of companies in 2018–2020

Company	Expenditures, billion rubles			2020 to 2018, %	Expenditures per 1 employee for 2020, thousand rubles	Ratio of social expenditures to net profit, %
	2018	2019	2020			
JSC Russian Railways	51.5	47.8	-	-	-	-
PAO Severstal	1.42	1.43	1.14	24.56	21.79	0.993
PJSC PhosAgro	0.86	1.12	1.03	16.51	57.80	2.136
Magnitogorsk Iron & Steel Works PJSC	1.74	1.97	1.82	4.40	32.20	3.533
PJSC Lukoil	16.9	17.4	16.7	1.20	160.2	8.453
PJSC Acron	0.664	0.680	0.650	2.15	56.87	11.433
Gazprom Neft PJSC	42.8	45.1	40.7	5.16	90.9	25.038
Compiled according to: [1–17].						

In our opinion, corporate demographic policy can become one of the most important elements of corporate social responsibility in countries with negative demographic forecasts. The goals of corporate demographic policy have two levels: 1) global – reducing social tension in society, increasing the quantitative and qualitative results of parenthood; 2) local – increasing the loyalty and effectiveness of the company's personnel, that is, employees who already have children or intend to become parents.

Thus, we see the advantages of business participation in solving demographic problems of society in the following:

A) for society:

1) Increasing birth rates.

The inclusion of one more subject in the demographic policy will show the population the importance of these problems for society, attention to them on the part of the most important economic entities, willingness to participate in their solution. This, in turn, after a while can lead to an increase in the reproductive norms in society, strengthening the public's perceptions of advantages and smoothing out the perceptions of the shortcomings of parenthood. Society's attitude toward domestic work creates prerequisites for the formation of a state information policy aimed at recognizing the importance of this type of work.

2) Reducing tension in society.

State and corporate policy based on treating employees with children in the same way as people with dual employment, who build professional and parental careers at the same time, has the potential to reduce social tension.

C) for business:

Improving the efficiency of interaction within work teams and the efficiency of work at enterprises.

In our opinion, the implementation of corporate demographic policy can solve the following tasks:

improving the socio-psychological climate at the enterprise; enhancing labor motivation and helping employees realize their potential both at work and in their family and parental sphere; reducing staff turnover rates, increasing employee loyalty; improving the health of employees and their children.

In our opinion, demographic policy implemented by different actors should remain holistic. For example, the government can set general principles for its implementation and improvement, formulate goals and incentive mechanisms for the actors (individual regions, businesses) that implement this policy. Regional authorities should adjust the policy so that it would correspond to the specific conditions prevailing in the region, economy and socio-cultural sphere. Enterprises should adapt these principles to the needs of specific employees.

The concept for corporate demographic policy: purpose and objectives

Corporate demographic policy as a system of measures aimed at supporting the needs of employees of the organization who, in addition to professional and labor functions, also perform family functions (including parental functions, care for elderly parents, etc.) [14] should receive conceptual approval. The concept for demographic policy of Russian organizations defines a system of views, starting points, principles, priorities, basic concepts and measures in the field of support and promotion of the health of workers; improving the conditions and the quality of life of Russian families; focusing on social obligations toward families with children; improving working conditions, creating jobs taking into account the changing age structure of the population; creating working conditions for mothers with children under the age of 3; motivating employees to a healthy lifestyle by creating accessible conditions for physical education, etc. [15; 16].

The purpose of corporate demographic policy in Russia is to ensure the most favorable moral, economic and social conditions for the implementation of parental and other family functions by employees, provided that they have an official job.

The main task of corporate demographic policy is to systematize and consolidate the principles, values and norms of employee support in terms of nurturing and shaping the future human capital of modern society, that is, in implementing measures to support and promote parenthood and parental labor. First of all, corporate demographic policy is focused on working parents and those who are potentially ready to become a parent while working in an organization.

The objectives of the implementation of Russia's corporate demographic policy are as follows:

- 1) treating employees of Russian organizations simultaneously as subjects of professional work and as persons with family responsibilities;
- 2) treating the family as the main value in the life of an employee, in the course of development and implementation of Russia's corporate personnel-related and social policy;
- 3) considering corporate demographic policy as a key element of social responsibility policy.

The basic principles of Russian corporate demographic policy, according to which it is developed and implemented, include a set of general rules based on the laws of the functioning and development of organizations and society as a whole:

- comprehensiveness, complexity, consistency and variability of initiatives implemented in the demographic sphere;
- non-discrimination against certain categories of personnel;
- compliance with legislative norms and other obligations assumed by organizations in the field of regulation of labor relations and labor incentives;

- taking into account the expectations and interests of participants in labor relations and other interested parties;

- diversification of the instrumental basis of corporate demographic policy with simultaneous enhancement of the intangible component;

- integration of parenting incentive methods into the overall system for employees' motivation and incentives;

- assessment of the effectiveness of the current practice of implementing corporate demographic policy and its continuous improvement;

- clarity and information transparency;

- regular monitoring and improvement of existing practices for the implementation of corporate demographic policy.

Corporate demographic policy is founded on the basic values and principles of corporate social responsibility. At the same time, it is focused to a greater extent on internal stakeholders, i.e. on employees with children or on those who are planning to have children and who have obligations to their family members.

Regulation of relations in the field of demographic policy implementation at the level of Russian organizations involves the following stages.

1. Working out and systematizing the goals, rules, principles and norms of internal policy within the organization of the relevant system of prioritization of the demographic sphere.

Working out corporate demographic policy is based on the principle of employee involvement in the process. Organizations may be recommended to establish appropriate specialized committees. The work of the profile committees should be organized on a voluntary basis, while the participation of employees with children in the work of the committees can be encouraged through tangible or intangible incentive measures. The composition of the committees should be occasionally updated.

2. *Developing a tool base for stimulating parenthood of employees.*

The tools for providing material incentives within the framework of a corporate demographic policy can be as follows:

- subsidizing preschool and general education (in particular, compensation for part of the cost of a child's attendance at a preschool educational institution, as well as school and extracurricular activities);
- opening of a corporate kindergarten or children's rooms;
- creating preferential lending programs for young families;
- developing financial assistance programs for young families and working parents.

The system of non-material incentives within the framework of corporate demographic policy may include the following areas:

- expanding the range of voluntary health insurance programs;
- introducing an advisory position of a family psychologist who can help employees solve their urgent problems (such consultations can be carried out both face-to-face and remotely);
- providing employees with opportunities to complete educational programs on parenting, child protection, and child rearing;
- organizing and hosting contests and competitions for employees' children;
- granting rewards to employees' children with excellent performance at school;
- conducting excursions to organizations for employees' children, organizing career days, etc.;
- holding corporate events ("Family Day", "Health Day", etc.), in which not only the employees themselves, but also their family members participate.

3. *Developing a system of information and communication support for corporate demographic policy. Supporting and developing professional dynasties.*

This stage implies that the personnel policy should consolidate provisions concerning the importance of employees as family members, respect for their family responsibilities in relation to their children and the older generation of their relatives.

The mechanisms for implementing the concept are grouped into four areas:

1. *Ensuring the protection of employees' life and health.* The main measures include reimbursement of expenses for medical services (including prenatal care and childbirth), corporate medicine, preventive campaigns, regular medical examination of employees, assistance from staff psychologists, programs for organizing sports leisure of employees, organization of a comfortable workplace, etc.

2. *Decent remuneration for work, including social support measures.* This category includes not only the payment of wages that meet the requirements of the labor market, but also the bonus fund that is effective and commensurate with the success of the company; measures to assist employees in matters of lending.

3. *Respect for employees' family responsibilities.* This becomes possible through the implementation of corporate services providing educational activity and leisure for employees' children; reimbursement of expenses for care activities for elderly relatives and family members requiring special assistance; measures aimed at maintaining a work-family balance, etc.;

4. *Effective system of interaction with employees.* Considering their staff as persons most interested in the success of the company, organizations with a high level of social responsibility are ready to offer them a transparent system of interaction, flexible work and vacation schedules, the possibility of remote work, etc.

Orientation toward the proposed model and its use by enterprises in the implementation of social policy will make it possible to provide the demographic measures implemented in the

country with consistency, complexity and comprehensiveness, which will increase the effectiveness of the state demographic policy as a whole, and the social and economic effects of the implementation of individual corporate programs.

The expected results of the introduction of the concept for corporate demographic policy primarily imply that it will help to provide the demographic measures implemented in the country with consistency, complexity and comprehensiveness, which will increase the effectiveness of the state demographic policy as a whole, and the social and economic effects of the implementation of individual corporate programs. The inclusion of the social institute of business in the implementation of demographic policy will help strengthen the confidence of employees in their employer, increase their loyalty, and create a solid foundation for the development of human capital at the meso-level. The joint activity of the government and organizations in the field of support and development of the demographic sphere can lead to an increase in the satisfaction of participants in labor relations, strengthening attitudes toward parenthood, increasing the volume of human capital and improving its quality, which plays a critical part in solving current socio-demographic problems in Russia.

The basic terms of the concept for corporate demographic policy can include several fundamentally important provisions.

An employee of an organization is a subject of labor law, an individual who works under an employment contract with an employer and receives a salary for this. The legal status of an employee is determined by labor legislation, labor and collective agreements, and internal regulations of the organization. The employee has the rights and obligations established by national labor legislation.

Employer is a legal entity, an individual who has entered into an employment relationship with an employee.

Family includes persons related by kinship and (or) property, living together and running a joint household⁴.

Young family comprises persons who are married in accordance with the procedure established by the legislation of the Russian Federation, including those raising a child (children), or a person who is the sole parent (adoptive parent) of a child (children), under the age of 35 inclusive⁵.

Demographic policy of the Russian Federation is aimed at promoting life expectancy, reducing mortality rate, increasing birth rate, regulating internal and external migration, preserving and strengthening people's health and improving the demographic situation in the country on this basis⁶.

Corporate policy is a system of standard rules regulating the conduct employees at work and the activities of the organization within the framework of the chosen development strategy.

Personnel policy is the vision, principles, priorities, norms, rules of conduct for personnel formulated (orally or in writing) by the management of the organization; it is mandatory for all participants in the personnel management process and is aimed at achieving the organization's strategic goals, taking into account continuously changing internal organizational conditions and requirements of the external environment.

Corporate social responsibility is a concept according to which organizations take into account

⁴ On the subsistence level in the Russian Federation: Federal Law 134-FZ, dated October 24, 1997 (as amended on December 29, 2020).

⁵ On youth policy in the Russian Federation: Federal Law 489-FZ, dated December 30, 2020. In: Collection of Legislation of the Russian Federation. January 4, 2021. No. 1 (Part I). Article 28.

⁶ On approving the Concept for Demographic Policy of the Russian Federation for the period up to 2025: Decree of the RF President no. 1351, dated October 9, 2007 (amended on July 1, 2014).

the interests of society and assume responsibility for the impact of their activities on the public sphere.

This obligation goes beyond the statutory obligation to comply with legislation and implies that organizations voluntarily take additional steps to improve the quality of life of employees and their families, as well as the local community and society in general.

Corporate demographic policy of Russian organizations is an integral system of principles, objectives, norms, rules of conduct and priority measures that organizations implement so as to support governmental decisions in the field of demography; they are mandatory for all participants in the personnel management process and they are developed taking into account internal organizational conditions and external demographic challenges facing the country and a specific region.

Conclusion

Sustainable development of Russian companies, based not only on economic but also on social factors, leads to a reduction in business risks, promotes competitiveness, increases personnel efficiency and customer loyalty, improves the reputation of the company, creates a positive contribution of the company to the economic and social development of the territory of its presence. This means that the national priorities for the development of society and the tasks of effective business are strategically not only compatible, but also directly related to each other, which brings to the fore the necessity to work out, implement and develop corporate social policy in general and corporate demographic policy in particular.

According to the study, Russian society has the prerequisites for the elaboration and implementation of corporate demographic

policy. One such prerequisite is the return of big business to the social space of its companies after the forced reset of social obligations in the 1990s. Another one is the fact that the preservation of the population, health and well-being have been included in the national development goals of the Russian Federation according to the Decree of the RF President⁷. One more prerequisite is the presence of a number of normative legal documents on the demographic policy of Russia (the Concept for Demographic Policy of the Russian Federation for the period up to 2025⁸; the Decree of the President of the Russian Federation “On the national security strategy of the Russian Federation; the Concept for Family Policy of Russia (approved by the Resolution of the Government of the Russian Federation no. 1618-r dated August 25, 2014); the national project “Demography”, etc.); all of them define basic principles, target indicators and tasks related to population reproduction, preserving people’s health, reducing working-age mortality, increasing life expectancy, etc.

The humanistic approach to social and labor relations that are viewed as the main vector of current socio-economic development requires that the relationship between labor and capital be revised comprehensively and the dilemma “economic efficiency or social justice” be resolved as well. A modern worker in the conditions of demographic shrinkage should become a value around which a system of social services and social programs should be deployed [17].

⁷ On the national development goals of Russia until 2030: Decree of the RF President, dated July 21, 2021. Available at: <http://www.kremlin.ru/events/president/news/63728> (accessed: October 10, 2021).

⁸ The Concept for Demographic Policy of the Russian Federation for the period up to 2025: Approved by the Decree of the RF President no 1351, dated October 9, 2007. Available at: <https://mintrud.gov.ru/ministry/programms/6> (accessed: October 10, 2021).

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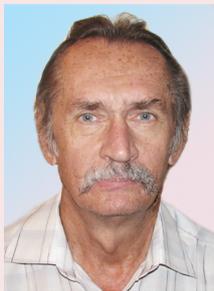
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Women and Men: Differences in Fertility and Reproductive Behavior Indicators*



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Abstract. The search for the reasons that determine birth rate dynamics remains relevant from the practical and theoretical viewpoints. The aim of our research is to assess whether Russia's population complies with the stable population model in terms of stability of sex structure. We make an attempt to calculate and assess reproduction indicators for male population. Having revealed that such calculations have methodological limitations, we propose a way to overcome them. According to calculations, in 2019 in Russia, the total fertility rate for women (1.504) was 9.1% higher than for men (1.378). The difference in the gross reproduction rate was 3.1% (0.730 for women and 0.708 for men), in the net reproduction rate –

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6.0% (0.719 for women, 0.678 for men). The difference in the value of the rate of natural increase in women and men is 5.0% (-11.5 and -12.1%, respectively). Due to the presence of two quantitatively different reproduction modes in the female and male generations, we doubt it would be possible to implement a stable population model. The age-related model of fertility in men, as well as in women, is shifting toward older ages (in the groups aged 25–29 and 30–34). The average age when men become fathers has also increased: from 31.51 years in 2011 to 32.40 in 2019. We also analyze the fertility rate model according to the age of the mother and father. We have determined that in most cases (70% in 2019) the father is older than the mother, in 19% of cases the mother is older than the father, in 11% – both parents are of the same age. Fathers are 1–4 years older than mothers in 44–64% of cases (depending on the age of the mother). It is noteworthy that the difference in the age of parents is higher when children are born out of wedlock. In the future, we find it interesting to study gender-related differences in reproductive motivation and other determinants of male and female fertility.

Key words: stable population, age-related fertility model, reproduction of the male population, reproductive behavior, fertility, age difference between fathers and mothers.

Introduction

The gender aspect of reproductive behavior is one of the topical issues of contemporary demography and sociology. Transformation of marriage and parenthood, tolerance to unmarried state and childlessness, legitimization of cohabitation, “aging” of marriage and fertility as the norm of today regulate the lifestyle of Russians, affecting the demographic situation. Whether trends in population reproduction (and demographic behavior) currently being recorded should be considered a new social challenge or a manifestation of demographic self-regulation, an inevitable consequence and manifestation of the demographic transition is an open question. This is confirmed by the discussion of the leading Russian demographers A.B. Sinel'nikov and A.G. Vishnevskii presented in the *Sociological Journal* [1, p. 84; 2, p. 93]. In our opinion, the question about the ideal and desirable size of the human population and the idea of demographic self-regulation in the context of the demographic transition have their place in the theory of global demographic dynamics (although the whole concept is based on the demographic history of individual countries). Whereas for local human communities, which undoubtedly possess

not only demographic, but also social parameters determining population reproduction, at least migration and demographic behavior must be considered, and most importantly, the relevance of the methodology used for demographic analysis must be assessed. Demographic forecasts, determining the type and mode of reproduction as the basis and result of the theoretical foundations of population dynamics are most often based on the stable population model, which assumes that the age-specific intensities of fertility and mortality and the age-sex pattern are maintained over time. In this connection, it is reasonable to estimate the intensity of fertility and the reproduction of the male population. Anticipating possible skepticism let us offer as an argument for not only the structural factor itself, which manifests itself in the proportionality of the sexes, but also the features of reproductive behavior that determine the age-specific natality model. From this point of view, we are interested in the ratio of the age of fathers and mothers, the scale of its differences, and their influence (the possibility of increasing or balancing the disproportion) on the age-sex pattern of reproductive contingents.

The purpose of the work is an attempt to assess the Russian population in terms of compliance with the stable population model in the aspect of invariability of the sex-age pattern. In order to achieve the goal, we calculated the total fertility rate and reproduction indices for the male population according to a substantiated methodology; identified the age-specific natality model for men and evaluated the age differences between fathers and mothers, which is the scientific novelty of the study.

Experience in the study of male reproduction and reproductive behavior broken down by gender, the methodological basis of the study

Calculations of birth and reproduction rates for male population are extremely rare. We have met only isolated references to the possibility of such calculations¹ and their implementation. R. Dinkel and I. Milenovic [3, p. 148] in their work give the data of the sample surveys in Germany, used to compare male and female fertility according to birth year from 1902–1904 to 1959–1961. As a baseline they used special age-specific birth rate, calculated for both sexes. The authors found out that there was a “convergence” of the age pattern of male and female fertility. In older birth cohorts, young women had higher fertility, while at the age of 40+, men’s fertility was more than five times higher than that of women. In younger cohorts, birth rates gradually balanced and such significant differences were no longer observed.

Similar conclusions were obtained by I. Harris, C. Fronczak, L. Roth, R. Meacham [4, pp. 186–187] for the U.S. population. Calculations of age-specific birth rates revealed that since 1980, the birth rate among women over 35 years of age has increased by almost 60%, while among women aged 20–34 it has increased by only 10%. At the same time, since 1980, the birth rate for men in the age of 30 and older has increased by 21% and for men

aged 40 and older by almost 30%. In contrast, the birth rate for men younger than 30 years of age has declined by 15%.

A new pattern of correlation between socio-economic development and fertility was revealed by M. Myrskylä, H.-P. Kohler and F.C. Billari [5, p. 742; 6, p. 30]. They showed that in developed countries, after reaching a certain level of the Human Development Index (HDI), the total birth rate begins to increase. The publication provoked lively discussion in the global scientific community, as they largely contradicted the established ideas about the dynamics of birth rate in the world.

C. Dudel and S. Klusener assessed the dynamics of male fertility in developed countries, showing its convergence with fertility in women (as well as the convergence of the ages of fathers and mothers at childbirth, although fathers are on average 2–4 years older), which the authors explain by the spread of gender equality. For developing countries, the works of B. Schoumaker revealed that the fertility of men is up to two times higher than that of women [8], and the age of fathers at childbirth is significantly higher than that of mothers [9, p. 826]. Greek researchers C. Bagavos and A. Tragiki, studying the impact of employment and education on fertility, proved that the decline in men’s fertility in 2000–2014 was due to employment problems, while for women it was not so clearly related to the economic crisis [10, p. 1438].

Calculations of birth rates for the male population carried out by V.N. Arkhangelskii showed that in the 1970s the total birth rate of men was slightly higher than that of women [11, p. 15], and in 1996 it was lower [12, p. 20–21]. A.B. Sinel’nikov proposed a model of reproduction of married couples and “the method of marriage potentials as a way to escape from gender double standards”².

¹ Multilingual Demographic Dictionary. Available at: <http://www.demopaedia.org>

² Sinel’nikov A.B. Marriage and birth rates without a gender double standard. *Demoscope Weekly*. 2017, no. 725–726. Available at: <http://demoscope.ru/weekly/2017/0725/tema01.php>

Sociologists and demographers have repeatedly raised the question of the differences and mutual influence of men's and women's reproductive attitudes on reproductive behavior. Obviously, man's position will to some extent influence woman's reproductive decisions, so it is very important to understand men's preferences with regard to childbearing.

A review of surveys of reproductive behavior conducted in Russia reveals a very significant fact: the preferred number of children among men is slightly higher than among women (*Tab. 1*). In addition, over time, gender differences are decreasing, remaining at the expense of the population of the republics.

Table 1. Average preferred number of children (desired/expected)

Year of study, title (if there is any)	Region of study	Desired/expected number of children among men	Desired/expected number of children among women	Source**
1973, 1983, 1993 – rural area	Republic of North Ossetia–Alania	4.39/-*, 4.27/-, 3.65/-	3.62/-, 4.00/-, 3.27/-	1
1974, 1984, 1994 – city		3.80/-, 3.83/-, 3.55/-	3.39/-, 3.68/-, 3.20/-	
1973–1974	Saint Petersburg	2.03/1.73	2.04/1.56	[13, pp. 129–137]
1979–1981	Republic of Mordovia (Saransk)	2.79/-	2.16/-	2
1981 (couples)	Saint Petersburg	2.70/-	2.50/-	[14, p. 106]
1982 (couples)	Moscow	1.91/-	1.88/-	3
1983–1984 (couples)	Makhachkala	2.87/-	2.75/-	3
1982	Moscow	2.56/1.97	2.44/1.81	[15, p. 62]
1983 “Children in an Urban Family”	Moscow	2.58/1.91	2.32/1.75	[16, p. 23]
1984 “Children in an Urban Family”	Saratov	2.52/2.04	2.42/1.92	[17, p. 7]
1984 “Children in an Urban Family”	Ufa	2.76/2.25	2.59/2.13	[17, p. 7]
1982–1983	Chelyabinsk Oblast (Zlatoust, Magnitogorsk)	2.79/2.15	2.51/1.90	[18, p. 96]
1986–1987	Yekaterinburg	2.49/1.78	2.36/1.60	[19, p. 42]
1993 (rural area)	Republic of Bashkortostan	3.46/2.69	2.77/2.62	[20, p. 170]
1989	Altai Republic and Altai Krai	-/2.72	-/2.33	[20, p. 170]
1994 Microcensus of RF population	Microcensus of RF population	2.25/-	2.18/-	[21, p. 96]
1994	Pskov Oblast	2.26/1.94	2.22/1.90	[22, p. 436]
1996–1997	Veliky Novgorod	2.38/1.89	2.40/1.82	[23]
1997 (couples under 5 years of marriage)	Naberezhnye Chelny	2.66/1.88	2.58/1.96	4
1997	56 constituent entities of RF	1.83/- 24 years old 1.90/- 31 years old	1.81/- 1.86/-	5
1999	Khanty-Mansi Autonomous Okrug –Yugra	2.42/1.69	2.19/1.54	[24, p. 136]
2000 (city)	Khanty-Mansi Autonomous Okrug –Yugra (Pokachi)	2.35/2.03	2.22/1.87	[25, p. 146]
2001	Public Opinion Foundation RF	2.51/-	2.40/-	6

End of Table 1

Year of study, title (if there is any)	Region of study	Desired/expected number of children among men	Desired/expected number of children among women	Source**
2001	Republic of North Ossetia–Alania	3.03/-	2.82/-	7
2003	Novgorod Oblast	2.5/2.02	2.42/1.92	[26, p. 66]
2005–2015 (rural area)	Republic of Sakha (Yakutia), Primorsky and Khabarovsk Krai.	-/1.74	-/1.52	8
2011–2012	Arkhangelsk Oblast	2.9/2.4	2.3/1.9	[27, p. 71]
2012 “Selective observation of the reproductive plans of the population”	All subjects of RF	2.30/1.92	2.28/1.92	9
2005–2021	Vologda Oblast	2005 – 2.16/1.77 2008 – 2.00/1.88 2011 – 2.04/1.83 2014 – 2.02/1.83 2017 – 2.22/1.93 2019 – 2.11/2.01	2005 – 2.14/1.70 2008 – 2.01/1.83 2011 – 2.10/1.87 2014 – 2.02/1.80 2017 – 2.22/1.89 2019 – 2.16/1.99	10 [28, pp. 51; 29, p. 37]
2017 “Selective observation of the reproductive plans of the population”	All subjects of RF	2.16/1.88	2.15/1.88	11
2018–2019 (city, couples) a family with children lifestyle	Cities in several regions of RF	2.8/2.0	2.7/1.9	[30, p. 63]
2020 “Demographic health of Russian regions”	10 constituent entities of RF	2.27/1.96	2.31/1.91	12
* No data.				
** Compilation according to:				
1 – Dzutsev Kh.V. Evolution of the Ossetian family and interfamily relations: An ethnosociological analysis: Doctor of Sciences (Sociology) dissertation. Vladikavkaz, 1998.				
2 – Savinov L.I. The impact of free time on the reproductive behavior of married couples (Case study of Saransk, 1979). <i>The Family and the Social Structure of Socialist Society</i> , Moscow, 1980. 123 p.				
3 – Aligadzhieva Z.M. Family as a subject of social life activity: Candidate of Sciences (Philosophy) dissertation. Moscow, 1986.				
4 – Aligadzhieva Z.M. Family as a subject of social life activity: Candidate of Sciences (Philosophy) dissertation. Moscow, 1986.				
Sadykova R.G. Comprehensive socio-hygienic study of the family and the health status of children raised in it: Candidate of Sciences (Medicine) dissertation. Kazan, 1998. 12 p.				
5 – <i>Kul'turnye miry molodykh rossiiyan: tri zhiznennye situatsii</i> [The Cultural Worlds of Young Russians: Three Life Situations]. Moscow, 2000. 95 p.				
6 – Available at: http://bd.fom.ru/report/map/tb011813 ; https://bd.fom.ru/report/cat/socium/demo/of011805				
7 – Lalaeva L.E. Reproductive potential of the modern family: Status and trends of development (Case study of the Republic of North Ossetia–Alania): Candidate of Sciences (Sociology) dissertation. Vladikavkaz, 2004. 15 p.				
8 – Trusova E.A. Features of reproductive behavior of rural residents. In: <i>Smysl, funktsii i znachenie raznykh otraslei prakticheskoi psikhologii v sovremennom obshchestve: sb. trudov Vseros. nauch.-prakt. konf. s mezhdunar. uchastiem</i> [The meaning, functions and significance of different branches of practical psychology in modern society: Collection of Scientific Works of the All-Russian Scientific-Practical Conference with International Participation]. Khabarovsk, 2017. 252 p. Available at: https://www.elibrary.ru/download/elibrary_35030263_75670449.pdf				
9 – Selective observation of the reproductive plans of the population. <i>Rosstat</i> , 2012. Available at: https://gks.ru/free_doc/new_site/RPN/Publisher/index.html				
10 – Monitoring data on the reproductive potential of the Vologda Oblast population, VoIRC RAS.				
11 – Selective observation of the reproductive plans of the population. <i>Rosstat</i> , 2017. Available at: https://gks.ru/free_doc/new_site/RPN17/index.html				
12 – Rostovskaya T.K., Kuchmaeva O.V., Zolotareva O.A. Evaluation of demographic attitudes by the eyes of men and women under conditions of fertility deficiency. <i>Zhenshchina v rossiiskom obshchestve=Woman in Russian Society</i> , 2021, Special Issue. DOI: 10.21064/WinRS.2021.0.8 (https://womaninrussiansociety.ru/wp-content/uploads/2021/01/%D0%A0%D0%BE%D1%81%D1%82%D0%BE%D0%B2%D1%81%D0%BA%D0%B0%D1%8F.pdf)				

How does a man's position affect the final fertility of a couple/woman? What is the childbearing potential of a modern Russian family, based on the reproductive intentions of men and women? A unique study on the identification of value orientations of husbands and wives, carried out by a research team led by A.I. Antonov, answers these questions [31]. Using the proprietary methodology, we evaluated the childbearing potential of families depending on the consistency of reproductive attitudes in the couple. We found that 26.5% of couples have a strong childbearing potential (couples with coincident and noncoincident attitudes toward having many children), 34.6% of couples have a weak potential, and 28.4% have a minipotential [31, p. 33]. The higher the similarity of wives' and husbands' attitudes toward multi-child parenting, the more likely their realization and the higher percentage of families with three or more children [31, p. 21]. In this regard, the importance of men's reproductive attitudes in the final number of children in families, and consequently in the process of population reproduction, is undeniable.

Methodological foundations of the study. Age and total birth rates are traditionally calculated only for women. However, the statistical information annually developed in Russia (statistical form p248) contains data on the distribution of children by age of mother and father, on the basis of which age-specific birth rates can be calculated for men as well. But when calculating these indicators, men, as compared to women, have two limitations.

The first limitation is due to the fact that while for women the proportion of unspecified age is very small (e.g., 0.06% in 2019 for the whole of Russia), for men it is substantial (10.2% in 2019 for the whole of Russia). Almost all cases (2019 – 96.6%) where the age of the father is not specified refer to the children registered on the mother's statement. Among them, there were 97.9% of such cases in 2019. Among those born in registered marriages,

the proportion of those whose father's age is not specified – 0.07%, and among those registered by joint statement of parents – 0.14%.

The second limitation is that the statistical treatment does not and cannot contain data on the distribution of children according to the father's age and succession of child's birth, because this information is indicated only with respect to the mother.

The first limitation can, with some convention, be overcome. Those children born with an unspecified age of the father can be conventionally distributed on different bases.

First, all children may be distributed according to the age of the father in the same proportion as in those cases where the age is given. Such an approach would probably be appropriate if the proportions of children with an unspecified age of the father were approximately equal for different birth registrations (in registered marriage, on a joint statement of the parents, on the statement of the mother). However, as noted above, the vast majority of cases in which the father's age is not specified occurs in the registration of children on the mother's statement, so the extent to which this approach is correct will depend on how close at different registrations the distribution of children by age of the father is. It is likely that they differ significantly. For example, in 2019, the average age of the father at birth of all children (for which the age of the father is indicated) in Russia was 32.8 years, for those born in registered marriage – 32.7 years, registered on the joint statement of parents – 33.5 years, registered on the statement of the mother – 34.6 years (calculated for 2.1% of children registered on the statement of the mother, for which the age of the father is indicated)³.

³ The average age of the father at birth in this case is not quite correct, as it is calculated not on the basis of age coefficients of birth rate, but on the basis of the distribution of absolute numbers of children by the age of the father, i.e. it depends on the age distribution of men in general. However, this dependence manifests itself here approximately equally for all variants of children registration. Thus, the values of the average age of the father at birth themselves are not quite correct in this case, but their correlation is quite correct.

Given such differences, it is apparently not correct to distribute children with an unspecified age of the father, in the vast majority of cases registered on the mother's statement, in proportion to the distribution of all children according to the age of the father.

Second, children registered on the mother's statement, for whom the age of the father is not specified, could be distributed according to the age of the father in proportion to the distribution of children registered on the joint statement of the parents, given that both were born outside of registered marriage. However, as shown above, the average age of the father differs significantly.

Third, we can assume that all children registered on the mother's statement are distributed according to the age of the father in the same way as those whose father's age is indicated. But there are only 2.1% of them, and there is no reason to assume that they are representative by this criterion (however, there is no reason for the opposite assumption either).

Fourth, we can assume that those born in registered marriage, registered on the joint statement of the parents and on the statement of the mother, differ in the average age (respectively, according to the age distribution) both of the father, and of the mother, and the distribution of those born by the age of the father for each age of the mother could be approximately the same. In this case, it would be possible to proportionally distribute children with an unspecified paternal age separately for each maternal age.

The average age of the mother of children born in registered marriage in Russia in 2019 (30.0 years) was almost the same as the average age of children born in registered joint statement of parents (30.1 years). The average age of the mother of children registered under the mother's statement, as well as the average age of the father, is different. But if the average age those children's fathers is higher than that of registered marriages and registered on the

joint statement of parents, the average age of the mother is, on the contrary, lower. In 2019, it was 28.9 years old⁴.

Thus, the difference in the average age of the father and mother in Russia in 2019 was greater for those born in registered marriages and those born under joint statement of the parents. The issue of differences in the ratio of the age of the father to the mother will be discussed in more detail below. Here we just note that the distribution of children by age of the father for each age of the mother is different for each category of registered children, judging by the average age of the father and mother. Consequently, a proportional distribution of children whose father's age is not specified separately for each age of the mother would not provide a more correct estimate of the distribution by age of the father for those born registered according to the mother's statement.

There was a relatively large difference in the average paternal and maternal age for children born as registered on the mother's statement in Russia in 2019 for almost all maternal ages (*Tab. 2*).

Thus, there is no unambiguously most acceptable basis for distributing children registered by mother's statement according to the age of the father. Relatively the most acceptable, apparently, is the conventionally accepted distribution of them, the same as for those children in this category of registration whose father's age is not stated. Calculation of the most accurate age coefficients of birth rates will provide relevant indicators of fertility and reproduction of the male population.

The difference in the birth rates of women and men is due to differences in the denominator, i.e. their numbers, whereas the numerator (the number of children born) is, of course, the same. This statement is true if we are talking about relative indicators of birth rate, in the calculation of which

⁴ The above discussion of calculating the average age of the father on the basis of the distribution of absolute numbers children born also applies here to the average age of the mother.

Table 2. Average age of the father depending on the age of the mother for those born in a registered marriage, registered on the joint statement of the parents and the mother's statement, in Russia in 2019, years

Mother's age	Average father's age			
	all children born	children born in a registered marriage	children born, registered on the joint statement of the parents	children born, registered on mother's statement
under 16	20.2	21.1	20.0	19.7
16	22.1	22.3	21.8	22.6
17	23.0	22.8	23.2	22.2
18	24.0	24.0	24.2	25.7
19	24.9	24.7	25.3	25.7
20	25.6	25.5	26.0	25.6
21	26.3	26.2	26.7	26.5
22	27.0	26.9	27.7	27.7
23	27.6	27.5	28.4	28.8
24	28.3	28.2	29.3	30.0
25	29.0	28.9	30.1	30.7
26	29.8	29.7	30.9	30.9
27	30.6	30.5	31.7	32.2
28	31.4	31.3	32.4	33.3
29	32.2	32.1	33.1	34.3
30	33.0	32.9	34.0	34.5
31	33.9	33.8	34.7	36.3
32	34.7	34.6	35.5	36.2
33	35.6	35.5	36.2	36.8
34	36.4	36.3	36.9	39.0
35	37.3	37.2	37.7	38.0
36	38.1	38.0	38.3	39.1
37	38.9	38.9	39.0	39.5
38	39.7	39.7	39.8	39.7
39	40.6	40.6	40.2	41.5
40	41.3	41.4	41.0	42.0
41	42.1	42.2	41.8	41.3
42	43.0	43.2	42.5	43.7
43	43.8	44.0	43.1	42.2
44	44.7	44.8	44.2	41.8
45	45.5	45.8	44.1	44.7
46	46.3	46.8	43.9	48.2
47	47.3	47.4	46.6	46.6
48	46.3	46.4	46.1	46.5
49	47.6	47.6	47.4	50.2
50	48.1	48.5	48.1	32.5
51	48.0	47.7	49.2	–
52	50.9	51.5	46.0	55.5
53	52.0	53.4	41.5	49.5
54	45.7	44.1	–	50.5
55 and older	52.4	53.0	46.8	60.5

Source: own compilation hereinafter, unless otherwise noted.

the numerator uses the total number of births (for example, if we calculate a special birth rate by relating the total number of births to the number of women or men of reproductive age; though, it is not very clear which upper limit of this age interval to use when calculating the indicator for men).

However, with regard to the total birth rate it should be borne in mind that it is calculated on the basis of age-specific birth rates, hence the differences in its value for women and men depend on the distribution of children by age of mother and father and the ratio of women and men by age, or rather on the combination of these two characteristics.

Reproduction rates essentially refer to the so-called stable population, which is "a theoretical

model of the population with age-specific birth and death rates and the age structure of the population unchanged over time"⁵. The net coefficient shows in what proportion among the population the replacement of generations will occur at a given level of fertility and mortality, the mode of reproduction, and the intrinsic rate of natural increase shows how the population will change annually.

Research results

It seems appropriate to make a comparative assessment of age and total birth rates for males, using all the above approaches to estimate the paternal age distribution of children registered on the mother's statement, for whom the age of the father is not specified (*Tab. 3*).

Table 3. Age and total birth rates for men in Russia in 2019 with different methods of estimating the distribution of children born according to the father's age

Father's age	All children born are distributed according to the age of the father in the same proportion as they are distributed in those cases where the age of the father is indicated	Children registered on the mother's statement, with the father's age not specified, are distributed according to his age in proportion to such distribution of children registered on the joint statement of the parents	All children born registered on the mother's statement are distributed according to the age of the father in the same way as those who have the age of the father indicated	Children with a father's age unspecified are allocated separately for each age of the mother	Average
under 16	0.1	0.1	0.1	0.1	0.1
16	0.3	0.5	0.7	0.6	0.5
17	1.1	1.5	2.1	1.6	1.6
18	3.1	3.8	3.3	4.2	3.6
19	6.1	6.8	6.8	7.6	6.8
20	11.8	13.1	13.1	13.8	12.9
21	21.2	22.7	21.9	23.8	22.4
22	32.6	34.1	33.8	35.4	34.0
23	43.4	44.3	44.3	45.9	44.5
24	56.6	57.0	56.2	58.7	57.1
25	66.5	66.3	65.6	67.9	66.6
26	73.5	72.7	72.7	74.3	73.3
27	78.7	77.4	76.7	78.7	77.9
28	80.7	79.3	78.2	80.2	79.6
29	81.8	80.2	78.7	80.8	80.4
30	83.6	82.0	80.8	82.4	82.2
31	82.4	80.7	80.4	81.1	81.1
32	79.4	78.0	77.8	78.0	78.3

⁵ *Population: An Encyclopedic Dictionary*. Moscow: Great Russian Encyclopedia, 1994. 475 p.

End of Table 3

Father's age	All children born are distributed according to the age of the father in the same proportion as they are distributed in those cases where the age of the father is indicated	Children registered on the mother's statement, with the father's age not specified, are distributed according to his age in proportion to such distribution of children registered on the joint statement of the parents	All children born registered on the mother's statement are distributed according to the age of the father in the same way as those who have the age of the father indicated	Children with a father's age unspecified are allocated separately for each age of the mother	Average
33	72.6	71.4	70.7	71.4	71.5
34	67.4	66.4	66.6	66.3	66.7
35	62.0	61.5	61.2	61.0	61.4
36	57.4	57.1	57.2	56.6	57.1
37	50.0	50.1	50.2	49.4	49.9
38	42.6	42.9	43.1	42.2	42.7
39	37.0	37.4	38.2	36.7	37.3
40	32.8	33.4	33.8	32.7	33.2
41	27.9	28.5	28.7	27.9	28.2
42	23.2	24.0	24.5	23.2	23.7
43	18.9	19.7	20.4	19.0	19.5
44	15.2	15.9	16.5	15.2	15.7
45	12.5	13.3	13.6	12.6	13.0
46	10.2	10.8	11.4	10.2	10.7
47	8.3	9.0	9.2	8.4	8.7
48	6.5	7.0	7.6	6.5	6.9
49	5.1	5.6	6.4	5.2	5.6
50	4.4	4.9	5.2	4.5	4.7
51	3.5	4.0	4.1	3.6	3.8
52	2.8	3.1	3.7	2.8	3.1
53	2.1	2.4	2.7	2.1	2.3
54	1.7	1.9	2.1	1.7	1.8
55	1.2	1.4	1.7	1.3	1.4
56	1.0	1.2	1.5	1.0	1.2
57	1.0	1.1	1.3	1.0	1.1
58	0.7	0.8	0.9	0.7	0.8
59	0.5	0.6	0.7	0.6	0.6
60 and older	1.9	2.2	2.8	1.9	2.2
under 20	2.1	2.4	2.5	2.7	2.4
20-24	34.0	35.0	34.6	36.3	35.0
25-29	77.0	75.9	75.0	77.0	76.2
30-34	77.1	75.7	75.3	75.8	76.0
35-39	50.1	50.1	50.3	49.5	50.0
40-44	23.7	24.4	24.9	23.7	24.2
45-49	8.6	9.2	9.7	8.6	9.0
50-54	2.9	3.2	3.5	2.9	3.1
55 and older	1.0	1.2	1.5	1.1	1.2
Total birth rate	1.373	1.378	1.379	1.381	1.378

The total birth rate for males in Russia in 2019 barely varies (ranging from 1.373 to 1.381), depending on which way the children registered by their mother's statement, whose father's age is not stated, are distributed according to their father's age (see Tab. 2).

The greatest differences in birth rates are observed in the age group of 20–24 years old (from 34.0 per 1,000 men (‰) to 36.3). In the age group of 25–29 years old, the value of this indicator ranged from 75.0 to 77.0‰, 30–34 years old – from 75.3 to 77.1‰, 40–44 years old – from 23.7 to 24.9‰, 45–49 years old – from 8.6 to 9.7‰. In other age groups (including 35–39 years old), the range of variation of birth rate does not exceed 1.0‰ points.

Among the one-year age groups, the widest range of variation in the birth rate is at the ages of 29 years (3.1‰ points), 22 years (2.8‰ points), and 30 years (2.8‰ points); it exceeds 2‰ points in only five other ages.

Thus, probably, we can consider that the age and total birth rate for men differ not very significantly, depending on the way the estimated age of the father is allocated to the births registered on the mother's statement, for which the age of the father is not

specified. As already noted, the difference between the maximum and minimum values of the total birth rate is 0.008.

At the same time, the average (from different ways of assessing the distribution of children born by their father's age) value of this indicator coincides with that calculated on the basis of the distribution of children registered on the mother's statement with unspecified age of father, in proportion to such a distribution of children registered by joint statement of parents. The greatest closeness of the indicator based on such calculation to the average also takes place for almost all age-specific birth rates (the only exceptions are the 30–34 age group and the one-year ages 17, 26, 31, 34, 37, and 38; see Tab. 2).

Considering this, it seems appropriate to estimate the distribution of children registered on the mother's statement by the age of the father (if it is not specified) in proportion to the distribution of children registered on the joint statement of the parents.

The available statistical data allow calculating age-specific birth rates for men for 2011–2019 (Tab. 4).

Table 4. Age-specific birth rates for men in Russia in 2011–2019
(number of children born per 1,000 men of a given age)

Father's age	2011	2012	2013	2014	2015	2016	2017	2018	2019
under 16	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1
16	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.5
17	2.5	2.6	2.6	2.4	2.3	2.1	1.6	1.5	1.5
18	6.4	6.4	6.4	6.3	5.9	5.6	4.9	4.3	3.8
19	10.9	11.1	10.7	10.8	9.9	9.5	8.4	7.9	6.8
20	20.9	21.0	20.6	19.5	18.9	16.7	15.4	14.2	13.1
21	34.5	35.6	35.2	33.6	31.8	29.7	25.7	24.6	22.7
22	50.3	49.2	48.6	47.6	46.1	42.9	38.6	35.8	34.1
23	64.8	64.4	61.2	58.8	58.1	54.3	50.7	48.1	44.3
24	78.7	80.7	74.8	72.0	70.3	67.5	61.3	59.5	57.0
25	87.2	93.3	89.4	86.3	82.3	78.1	71.8	68.3	66.3
26	94.7	98.4	99.5	97.5	95.4	88.7	79.2	77.1	72.7
27	99.9	102.5	101.1	104.7	103.6	97.5	85.9	81.2	77.4
28	100.0	105.2	103.7	104.0	108.7	104.7	92.0	84.6	79.3

End of Table 4

Father's age	2011	2012	2013	2014	2015	2016	2017	2018	2019
29	97.3	103.7	102.8	103.9	106.1	106.7	94.4	88.9	80.2
30	91.2	100.0	101.1	102.5	105.1	103.7	94.4	90.1	82.0
31	85.5	91.7	94.7	97.9	100.8	99.8	88.4	88.6	80.7
32	83.7	85.1	85.6	91.2	94.4	94.4	84.1	80.8	78.0
33	78.0	82.2	78.7	81.4	86.2	87.6	79.2	76.8	71.4
34	71.8	76.1	75.6	75.0	76.4	79.3	73.1	70.8	66.4
35	64.1	70.0	69.7	70.9	69.5	70.3	66.7	66.2	61.5
36	57.4	62.6	63.9	65.3	65.5	62.8	58.6	59.1	57.1
37	52.2	54.8	55.9	58.3	58.8	58.7	52.3	50.8	50.1
38	45.7	48.4	48.4	50.7	51.3	51.9	46.7	45.0	42.9
39	40.2	42.2	42.8	43.7	44.2	45.3	41.8	40.4	37.4
40	33.8	37.6	37.5	38.0	37.5	38.3	36.2	35.4	33.4
41	28.0	30.6	32.2	32.7	32.1	31.5	30.1	29.8	28.5
42	24.7	25.4	25.7	27.4	27.0	26.8	25.1	24.5	24.0
43	19.9	21.4	21.7	21.9	22.8	22.4	20.9	19.8	19.7
44	16.2	17.4	18.0	18.6	18.0	18.9	17.2	16.9	15.9
45	12.4	14.5	14.9	15.4	14.8	14.9	14.4	13.5	13.3
46	10.1	10.9	12.2	12.7	12.4	12.1	11.3	11.4	10.8
47	8.2	8.6	9.4	10.0	10.0	10.2	9.2	9.0	9.0
48	6.4	6.9	7.3	7.9	8.1	8.4	7.7	7.4	7.0
49	5.2	5.5	5.7	6.2	6.3	6.7	6.2	6.2	5.6
50	3.8	4.8	4.7	5.0	4.9	5.1	5.2	5.1	4.9
51	3.1	3.3	3.6	3.9	3.9	4.1	4.0	4.1	4.0
52	2.7	2.8	2.8	3.2	3.2	3.2	3.0	3.1	3.1
53	2.0	2.1	2.3	2.4	2.6	2.7	2.6	2.5	2.4
54	1.6	1.6	1.9	2.0	2.0	2.2	2.0	1.9	1.9
55	1.3	1.2	1.4	1.6	1.6	1.6	1.6	1.5	1.4
56	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.3	1.2
57	0.8	1.1	1.0	0.9	1.0	1.1	1.0	1.0	1.1
58	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
59	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6
60 and older	1.8	2.2	2.3	2.2	2.2	2.4	2.3	2.2	2.2
under 20	4.6	4.5	4.4	4.3	3.9	3.6	3.1	2.8	2.4
20–24	51.0	52.1	50.5	49.0	47.4	44.0	39.6	37.5	35.0
25–29	95.7	100.5	99.3	99.4	99.5	95.7	85.4	80.9	75.9
30–34	82.3	87.2	87.4	89.9	92.9	93.3	84.0	81.5	75.7
35–39	52.2	55.9	56.3	57.9	58.1	58.2	53.5	52.7	50.1
40–44	24.8	26.8	27.2	27.9	27.6	27.8	26.1	25.4	24.4
45–49	8.3	9.1	9.8	10.4	10.4	10.6	9.9	9.6	9.2
50–54	2.7	2.9	3.1	3.2	3.2	3.4	3.3	3.3	3.2
55 and older	1.1	1.2	1.2	1.3	1.3	1.3	1.2	1.2	1.2

The age pattern of birth rates for men in Russia is shifting to older ages, with the highest birth rates in the 25–29 and 30–34 age groups. In 2011, the birth rate of 25–29-year-old men was significantly higher than that of 30–34-year-olds (by 16.3%). In subsequent years, the difference between the two steadily decreased and was 13.6% in 2013, 7.1% in 2015, and 1.7% in 2017. In 2018 and 2019, we can essentially talk about equality in birth rates for males in these two age groups: in 2018, the rate was slightly higher (0.7%) at ages 30–34, and in 2019, it was 0.3% higher at ages 25–29.

While in 2011 the birth rate for men in the 35–39 age group was only 2.4% higher than in the 20–24 age group, in 2019 the difference between the two increased to 43.1%. Accordingly, the average age of fathers at birth of children is also increasing: 2011 – 31.51 years; 2012 – 31.63; 2013 – 31.77; 2014 – 31.92; 2015 – 31.97; 2016 – 32.16; 2017 – 32.26; 2018 – 32.34; 2019 – 32.40.

One might think that the shift of the male birth rate model to older ages should contribute to relatively more positive dynamics of the total birth rate than that of women, as the contribution of birth rates at relatively older ages, in which the proportion of women is higher, increases in this indicator, which contributes to the underestimation of age-specific birth rates for them. For the same reason, the increase in the average age of the mother at birth, occurring almost to the same extent as that

of the fathers, should also contribute to this: 2011 – 27.75; 2012 – 27.86; 2013 – 27.98; 2014 – 28.13; 2015 – 28.24; 2016 – 28.43; 2017 – 28.51; 2018 – 28.65; 2019 – 28.70.

However, there is an opposite situation: if in 2011 the total birth rate for men in Russia was higher than for women, then since 2012, on the contrary, the value of the indicator for women has been higher than for men, and the difference between them is increasing every year (*Tab. 5*).

One should recall another factor mentioned above, which may influence the ratio of total birth rates for women and men and their dynamics. This is the ratio of the number of women and men in active reproductive ages (*Tab. 6*).

The proportion of men in the 25–29 age group increased significantly over the period under consideration (in Russia the highest birth rates were recorded for both women and men in this age group). Accordingly, the proportion of men in this age group increased, which relatively (as compared to women) increased the denominator when calculating the age-specific birth rate for men and, consequently, decreased its value. The increase in the proportion of men in the 30–34 age group was slightly smaller, but also very significant (since 2017, there have been more men in this age group than women). Until 2014, the proportion of men in the 20–24 age group increased slightly; in subsequent years, the proportion of men in the 35–39 age group increased.

Table 5. Total birth rates for women and men in Russia in 2011–2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Women	1.582	1.691	1.707	1.750	1.777	1.762	1.621	1.579	1.504
Men	1.603	1.688	1.681	1.700	1.705	1.674	1.518	1.464	1.378
Difference	-0.021	0.003	0.026	0.050	0.072	0.088	0.103	0.115	0.126

Table 6. The number of men per 1,000 women aged 20–39 in Russia in 2011–2019 (annual average)

Age	2011	2012	2013	2014	2015	2016	2017	2018	2019
20–24	1,032	1,035	1,037	1,041	1,042	1,041	1,042	1,041	1,039
25–29	1,009	1,013	1,017	1,021	1,025	1,030	1,034	1,038	1,045
30–34	983	989	994	998	998	999	1,003	1,007	1,011
35–39	955	954	955	957	961	965	971	976	981

Table 7. Indicators of female and male reproduction in Russia in 2011–2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gross reproduction rate									
Women	0.769	0.822	0.830	0.849	0.863	0.856	0.787	0.764	0.730
Men	0.824	0.868	0.864	0.874	0.877	0.860	0.781	0.752	0.708
Net reproduction rate									
Women	0.752	0.803	0.813	0.832	0.847	0.841	0.774	0.752	0.719
Men	0.770	0.811	0.809	0.820	0.827	0.815	0.742	0.720	0.678
Intrinsic rate of natural increase (‰)									
Women	-10.3	-7.9	-7.4	-6.6	-5.9	-6.1	-9.0	-10.0	-11.5
Men	-8.4	-6.7	-6.7	-6.3	-6.0	-6.4	-9.3	-10.2	-12.1

Thus, the more significant decrease in mortality among men compared to women caused relatively lower age-specific birth rates and, as a result, contributed to the less positive dynamics of the total birth rate of men.

The age and total birth rates for men, which differ from those for women, also predetermine other indicators of population reproduction (Tab. 7).

While the total birth rate for men in Russia has been lower than for women since 2012, the gross reproduction rate has been lower only since 2017. These differences are due to the fact that when calculating the gross reproduction rate, the proportions of girls and boys among newborns are used, respectively, and more boys are born than girls.

However, a lower net reproduction rate for men than for women has been observed since 2013, and the gender difference in this value is greater in subsequent years than in the gross reproduction rate. The fact is that when calculating the net reproduction rate, the numbers living from the mortality tables are used, and men's numbers are lower than women's due to a relatively higher mortality rate.

The intrinsic rate of natural increase of the population is calculated as the natural logarithm of the net reproduction rate divided by the generation length (the average age of mothers/fathers at birth of daughters/sons who survive to the age of mother/father). Men have a longer generation length because they have a higher average age at first childbirth than women. For example, in 2019,

the generation length for women in Russia was 28.66 years and for men – 32.18 years. A higher denominator value when calculating the intrinsic rate of natural increase in men reduces the value of the rate (of course, we are talking about the absolute value of this rate, without considering the sign, and since it is negative in Russia, the relatively large length of male generation underestimates the relative natural decrease in this indicator). While the net reproduction rate for men has been lower than for women since 2013, the relatively large natural decrease (in terms of the intrinsic rate) has been since 2015.

Available annual statistical information makes it possible not only to calculate birth and reproduction rates for women and men, but also to analyze the distribution of children by age of mother and father.

The above (see Tab. 2) shows that in 2019 for women of all one-year age groups in the interval from 18 to 37 years old, the smallest difference in the age of father and mother was recorded for those who were born in a registered marriage. On the other hand, the most significant difference in most one-year age groups of women in this age interval (except for ages 20–22 and 26) is in the age of the father and mother of the children registered on the mother's statement.

In addition, the average difference between the age of fathers and mothers decreases for relatively older women. For those women who, in a registered marriage, became mothers at the age of 18 it is 6.0 years; at 20 years old – 5.5; at 25 – 3.9; at 30 – 2.9; at 35 – 2.2; at 40 – 1.4; at 45 – 0.8. On average, a

Table 8. Combination of maternal and paternal age depending on maternal age at birth in Russia in 2019, %

Mother's age	All children born			Children born in a registered marriage			Children born, registered on the joint statement of the parents		
	age of the mother and father coincides	father is older than mother	mother is older than father	age of the mother and father coincides	father is older than mother	mother is older than father	age of the mother and father coincides	father is older than mother	mother is older than father
under 16	4.5	95.5	–*	2.6	97.4	–	4.9	95.1	–
16	3.8	95.3	0.9	2.1	97.8	0.1	6.9	90.8	2.3
17	4.6	93.6	1.8	3.3	95.9	0.8	6.3	90.6	3.1
18	5.0	93.2	1.8	4.4	94.5	1.1	6.4	89.9	3.7
19	4.6	93.3	2.1	4.5	93.7	1.8	4.9	91.8	3.3
20	5.5	91.5	3.0	5.3	91.9	2.8	6.1	89.7	4.2
21	6.4	89.8	3.8	6.2	90.3	3.5	7.0	87.1	5.9
22	7.3	87.6	5.1	7.3	87.9	4.8	7.1	85.5	7.4
23	8.4	85.0	6.6	8.5	85.3	6.2	7.4	83.4	9.2
24	9.6	82.4	8.0	9.8	82.4	7.8	7.7	82.0	10.3
25	10.3	79.4	10.3	10.5	79.4	10.1	8.1	79.9	12.0
26	10.6	77.7	11.7	10.9	77.7	11.4	8.1	77.8	14.1
27	11.4	75.5	13.1	11.8	75.4	12.8	7.8	77.1	15.1
28	11.9	73.3	14.8	12.3	73.2	14.5	8.3	73.4	18.3
29	12.2	70.8	17.0	12.6	70.8	16.6	9.1	70.6	20.3
30	12.4	68.2	19.4	12.7	68.2	19.1	9.1	68.4	22.5
31	12.4	65.8	21.8	12.9	65.7	21.4	8.5	66.8	24.7
32	12.3	62.9	24.8	12.8	62.7	24.5	8.3	64.0	27.7
33	11.6	61.3	27.1	12.1	61.3	26.6	8.2	61.1	30.7
34	11.0	59.7	29.3	11.5	59.8	28.7	7.5	58.4	34.1
35	11.2	58.2	30.6	11.6	58.3	30.1	8.2	57.4	34.4
36	11.0	56.2	32.8	11.5	56.5	32.0	8.2	54.5	37.3
37	10.0	55.5	34.5	10.5	55.7	33.8	7.5	54.6	37.9
38	10.1	54.5	35.4	10.6	54.9	34.5	7.3	52.4	40.3
39	9.9	53.7	36.4	10.4	54.5	35.1	7.1	50.0	42.9
40	9.3	52.4	38.3	9.9	53.2	36.9	6.2	48.1	45.7
41	9.3	51.7	39.0	9.8	52.6	37.6	6.7	48.2	45.1
42	9.0	51.2	39.8	9.4	52.5	38.1	7.3	45.4	47.3
43	10.2	49.7	40.1	10.7	50.9	38.4	8.1	45.0	46.9
44	10.1	48.8	41.1	10.7	50.4	38.9	7.6	43.1	49.3
45	9.5	47.6	42.9	10.1	49.9	40.0	6.5	37.1	56.4
46	9.6	45.6	44.8	8.9	48.9	42.2	12.1	27.5	60.4
47	9.2	48.8	42.0	10.0	50.0	40.0	7.1	40.5	52.4
48	4.9	37.3	57.8	6.1	36.5	57.4	–	41.7	58.3
49	13.2	33.0	53.8	14.1	33.8	52.1	5.9	29.4	64.7
50	8.1	43.2	48.7	9.5	44.5	46.0	–	44.4	55.6
51	12.8	33.3	53.9	13.3	33.3	53.4	11.1	33.3	55.6
52	–	47.4	52.6	–	46.7	53.3	–	33.3	66.7
53	10.5	47.4	42.1	12.5	56.2	31.3	–	–	100.0
54	8.3	8.3	83.4	11.1	11.1	77.8	–	–	–
55 and older	1.5	51.5	47.0	1.7	55.0	43.3	–	14.3	85.7

* The youngest group by age of father and mother in the statistical development is "under 16 years old", so the combination of age of father and mother in this case is defined rather conventionally. The coincidence of the age of the mother and father is noted when the age of both is indicated as "under 16 years old". Among them, there are probably those children whose father is older than the mother, or, on the contrary, the mother is older than the father, but it is impossible to identify them.

larger difference in father's and mother's age is true for older mothers, whose children were registered under the statement of both parents. For 18-year-old mothers, it is 6.2 years; for 20-year-olds – 6.0 years; for 25-year-olds – 5.1 years; for 30-year-olds – 4.0 years; for 35-year-olds – 2.7 years; for 40-year-olds – 1.0 year; as for mothers aged 45 and older, the fathers are on average younger (see Tab. 2).

In 2019, in Russia the age of mother and father coincided in 10.6% of children. This indicator was slightly higher for children born in registered marriage (11.0%) and lower for those born under joint statement of parents (7.8%). The proportion of children born with a father older than their mother is 70.2%, and for those with the mother older than their father – 19.2%. For children born in registered marriages, these indicators are 70.3% and 18.7%, respectively. The proportion of those with the father older than the mother (69.3%) is slightly lower, but the proportion of children with the mother older than the father (22.9%) is higher among those registered by joint statement of parents.

As shown above, the difference in the average age of the father and mother differs significantly depending on the age of the mother at childbirth. These differences are also evident in the rates of the combination of maternal and paternal age (*Tab. 8*).

The proportion of children whose mothers and fathers are of the same age increases with the age of the mother and reaches a maximum at the age of 30–31, amounting to 12.4% (Russia, 2019). It decreases relative to older mothers.

Among those children born in registered marriages, the proportion of those whose parents are of the same age is significantly higher than among those born under joint statement of the parents. The only exception is observed for children of mothers under the age of 22. The maximum value of this indicator is among children who were born in a registered marriage and whose mothers were 31 years old (12.9%; it is even higher among mothers aged 49 (14.1%) and 51 (13.3%), but because of

the relatively small numbers of children there may be random fluctuations in the index), and among those registered under joint statement of parents, whose mothers are aged 29–30 (9.1%; there may also be random fluctuations in the numbers born to mothers aged 46 (12.1%) and 51 (11.1%)).

The proportion of children whose father is older than the mother decreases with the older age of the mother. For those children whose mother's age is under 21, the father is older than the mother in more than 90% of cases, with the mother's age 23 – 85.0%, 25 years – 79.4%, 30 years – 68.2%, 35 years – 58.2%, 40 years – 52.4%, and starting at 43 years, less than 50% (Russia, 2019).

The proportion of those born in registered marriages whose father is older than the mother is higher than among those registered under joint statement of parents in the age range of mothers under 25. In the age range of mothers from 25 to 32 years old, the situation when fathers are older tends to occur more often among those born under joint statement than among those born in registered marriages (with the exception of mothers aged 29). When mothers are at an older age, the proportion of children born with an older father is again higher among those born in registered marriages.

In contrast to the decreasing proportion of children born by older women whose fathers are older than their mothers, the proportion of those whose mothers are older than their fathers is, on the contrary, increasing. At the mother's age of 22 years 5.1%, 25 years – 10.3% (the same number as the coincidence of the age of mother and father), 30 years – 19.4%, 35 years – 30.6%, 40 years – 38.3%, 45 years – 42.9%.

Among children born under joint statement of parents, the proportion of those whose mother is older than their father is higher than among those born in registered marriages. Differences in older ages of mothers are most significant; for example, in 2019 in Russia, they exceeded 5 percentage points for those born whose mothers were aged 34, 36, and

38 or older. Beginning at age 42, among children born under joint statement of parents, those whose mothers are older than their fathers outnumber those whose fathers are older than their mothers, and from the age of 45, the proportion of the former exceeds 50 percent (see Tab. 8).

Fathers of the majority of children born are older than their mothers. The age difference between them and the way it differs depending on the age of the mother and the nature of birth registration (registered marriage, joint statement of parents) are shown in *Table 9*.

Table 9. Distribution of children born whose father is older than their mother, by age difference of parents in Russia in 2019, %

Mother's age	All children born			Children born in a registered marriage			Children born, registered on the joint statement of the parents		
	the father is older than the mother by:			the father is older than the mother by:			the father is older than the mother by:		
	1–4 years	5–9 years	10 years and more	1–4 years	5–9 years	10 years and more	1–4 years	5–9 years	10 years and more
16	44.3	38.9	16.8	42.4	42.5	15.1	47.7	32.0	20.3
17	44.4	38.8	16.8	49.0	36.8	14.2	38.2	41.4	20.4
18	41.6	42.4	16.0	42.4	43.2	14.4	39.6	40.6	19.8
19	43.3	42.5	14.2	44.1	43.1	12.8	40.5	40.3	19.2
20	46.5	40.1	13.4	47.2	40.6	12.2	43.4	37.7	18.9
21	48.2	39.5	12.3	49.1	39.6	11.3	43.8	38.9	17.3
22	50.5	38.4	11.1	51.4	38.6	10.0	44.0	37.5	18.5
23	53.1	37.1	9.8	54.2	37.0	8.8	44.5	38.5	17.0
24	55.6	35.5	8.9	56.9	35.3	7.8	44.9	37.5	17.6
25	58.5	33.3	8.2	59.7	33.1	7.2	47.2	35.1	17.7
26	60.2	31.6	8.2	61.6	31.3	7.1	47.2	34.6	18.2
27	61.9	30.1	8.0	63.4	29.8	6.8	48.8	33.2	18.0
28	63.2	28.6	8.2	64.7	28.3	7.0	49.1	32.1	18.8
29	63.6	28.2	8.2	65.1	27.8	7.1	49.3	32.3	18.4
30	63.1	28.2	8.7	64.9	27.6	7.5	47.6	33.3	19.1
31	62.9	27.9	9.2	64.6	27.4	8.0	49.5	31.9	18.6
32	62.0	27.9	10.1	63.9	27.4	8.7	48.1	31.6	20.3
33	61.0	28.3	10.7	62.9	27.9	9.2	47.9	30.9	21.2
34	60.5	28.6	10.9	62.6	28.1	9.3	46.5	31.9	21.6
35	59.7	28.8	11.5	61.6	28.4	10.0	47.4	31.4	21.2
36	58.4	29.6	12.0	60.6	29.0	10.4	45.7	32.8	21.5
37	57.7	29.9	12.4	59.7	29.3	11.0	47.1	33.5	19.4
38	58.1	29.4	12.5	60.5	28.8	10.7	45.5	32.6	21.9
39	57.4	29.9	12.7	59.2	29.6	11.2	48.2	31.4	20.4
40	57.2	29.7	13.1	59.3	29.3	11.4	46.1	32.2	21.7
41	57.0	30.1	12.9	59.1	29.6	11.3	46.9	32.4	20.7
42	57.1	29.3	13.6	59.3	28.8	11.9	46.4	31.3	22.3
43	59.0	28.8	12.2	61.1	28.2	10.7	48.6	31.2	20.2
44	56.7	28.6	14.7	60.3	27.0	12.7	39.2	36.9	23.9
45	56.9	29.4	13.7	58.8	28.7	12.5	46.4	33.3	20.3
46	52.3	29.9	17.8	52.0	30.7	17.3	56.0	24.0	20.0
47	57.4	24.6	18.0	56.0	29.0	15.0	58.8	5.9	35.3
48	56.6	26.4	17.0	59.5	23.8	16.7	50.0	40.0	10.0
49	50.0	33.3	16.7	58.3	25.0	16.7	20.0	80.0	0.0
50*	59.4	34.4	6.2	57.2	35.7	7.1	75.0	25.0	0.0

* For older mothers, it is impossible to single out a group with a difference in the age of the father and mother "10 years and more", since the last age group for fathers is "60 and older".

In 2019, among children born in Russia whose father is older than their mother, the proportion of those with a 1–4 year difference in the age of their parents increased with the age of the mother and peaked for 29-year-old mothers. It exceeded 60% in the age range of 26- to 34-year-old mothers and was slightly lower at older ages. The highest proportion of those whose father is 5–9 years older than the mother occurs in relatively younger women, the highest in 2019 when the mother is 18 (42.4%) and 19 (42.5%) years old. This proportion is lower at older ages (20 years old – 40.1%; 23 years old – 37.1%; 27 years old – 30.1%). If the mother is older than 28 years, the proportion of children born whose father is 5–9 years older than the mother no longer exceeds 30% (except for some ages) and is in the range of 28–30%.

The highest proportion of children whose father is 10 years or more older than the mother is typical for the youngest mothers and, conversely, for those who gave birth at age 35 and older. In 2019, it was 16% or more for mothers in the age of 16–18 and 46–49; less than 10% for women who gave birth at the age of 23–31 (less than 9% at the age of 24–30, and the lowest at 27 – 8.0%).

While the proportion of those whose father is older than the mother does not differ significantly in the groups of those born in registered marriage and those registered under joint statement of parents (see Tab. 9), variations in their distribution by the age difference between father and mother are significant. The proportion of those with a father 1–4 years older than the mother among those born in a registered marriage is greater than 50% for all mothers aged 22 years and older, and exceeds 60% for mothers aged 26–36 years. Among children registered under joint statement of parents, it is the highest (not including women over 45 years of age, because random fluctuations can occur in this group due to the relatively small number of children born) among mothers aged 31 years (49.5%).

The proportion of children whose father is 5–9 years older than their mother, at the age of the mother between 23 and 45, is slightly higher among registered under joint statement of parents (the difference tends to be 2 to 4 p.p.) than among those born in registered marriages.

Significantly larger differences are typical for the proportion of children born whose father is 10 years or more older than the mother. It is much higher among those born under joint statement of parents than among those born in registered marriages. At the most active reproductive ages (age of mother from 25 to 36) the difference in the value of the indicator between them exceeds 10 p.p. If among children born in registered marriages the proportion of those whose father is 10 years or more older than the mother decreases slightly at the active reproductive age of mothers, then among those born under joint statement of parents the value of this indicator differs little depending on the age of the mother (it is slightly higher among women aged over 32 years; see Tab. 9).

One can assume that older parents “compensate” for their age with significantly younger partners. These couples are often without registration at the civil registry offices and with a high probability of having few children.

Discussion and conclusions

The problem of calculating birth and reproduction rates for the male population is relevant in modern demographic studies not only in Russia. Thus, the website of Statistics Sweden presents the total birth rate for women and men. At the same time, it is noted that data on some fathers are missing, and this leads to an underestimation of the birth rate for men⁶. At the same time, given the methodological options outlined above, such calculations are possible and allow expanding the understanding of demographic reality.

⁶ http://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__BE__BE0101__BE0101H/FruktsamhetSum/

In 2019, Russia's total birth rate for women (1.504) was 9.1% higher than for men (1.378). The difference in the value of the gross reproduction rate was significantly smaller, amounting to 3.1% (0.730 for women and 0.708 for men). The net reproduction rate for women (0.719) was 6.0% higher than for men (0.678). The difference in the value of the intrinsic rate of natural increase between women and men was 5.0% (-11.5 and -12.1‰, respectively).

The existence of two quantitatively different regimes of reproduction in the female and male populations casts great doubt on the fundamental possibility of implementing the model of a stable population, for the change in the sex composition (due to the sex differentiation of the reproduction regime) makes the population unstable. This issue has long been considered in the scientific literature (one of the most famous works in Russian is a translated article by L. Taba [33]), but there is still no satisfactory solution to the problem. Thus, our work confirms the existence of a problem related to the application of the stable population concept for forecasting the demographic situation in Russian reality.

Age-specific natality model for men and women changes toward a shift in childbearing to older ages, and more often fathers are older than mothers. The favorability of the sex ratio decreases with age, and

there are no longer enough peers for women after the age of 35 (981 men per 1,000 women aged 35–39). Taking into account the revealed difference in the ages of the fathers and mothers, we can confidently state that the chances of finding a partner and having children are significantly lower for women in the age of 30 and older (for 1,000 women aged 30–34 there are 932 men aged 35–39 and 815 men aged 40–44; for women aged 34–39 – 858 men aged 40–44 and 780 men aged 44–49), while the ratio of 20–24-years old women and peer men as well as men of older age groups is quite favorable (for 1,000 women aged 20–24 there are 1,039 men aged 20–24, 1,462 men aged 25–29 and 1,855 men aged 30–34). In this regard, increasing age of mothers giving the first birth and age of marriage carries the risk of the consolidation of few-child parenting in the reproductive behavior of Russians, further transformations of the institutions of family and parenthood. In terms of demographic policy, it is advisable to pay more attention to young families. Measures to support the birth of first-borns have been expanded in time, which will help to curb postponement of giving first birth and reduce the protogenetic interval. However, the introduction of an age limit for receiving support after 2030, when the structural factor becomes more favorable, will contribute to higher birth rate among young people, especially young men.

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Open and Latent Unemployment in the Context of the Pandemic



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Abstract. The specifics of the pandemic crisis and the features of the Russian labor model suggest that the impact of this crisis on the labor sphere may differ from the usual implications of crisis-driven recessions in economic activity, and create new points of vulnerability. The aim of this article is to trace changes taking place in the sphere of employment during the pandemic, to reveal how unemployment, including its latent forms, is spreading, and to identify risk areas that should become the focus of public policy. On the basis of available statistics data from Rosstat and independent sociological surveys, we explain significant discrepancies between the dynamics of objective indicators of unemployment and the extent of people's concerns related to their perception of this problem; we assess the structure of unemployment and the scale and dynamics of its latent component. The study has shown that at the peak of the crisis, latent unemployment exceeded open unemployment by more than three times. Unemployment, either in an open or latent form, has affected every fourth worker. Nevertheless, in general, in terms of the dynamics of macroeconomic proportions, the labor sphere is coping with the challenges of the crisis: the sector of large and medium-sized enterprises managed to maintain almost pre-crisis levels of employment, open

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unemployment remained within socially acceptable limits, a dangerous surge in latent unemployment was overcome by the beginning of the third quarter of 2020. At the same time, serious shifts have taken place in the usual structure of redundancies: highly qualified and educated workers employed in key sectors of intangible production, who felt confident in the labor market and got used to the stability of their socio-economic situation, have been considerably affected. Geographically, the crisis has had the most serious impact on large cities with a significant amount of middle class population. This aggravated the acuteness of people's perceptions of the crisis and jeopardized the preservation and reproduction of elite segments of national human potential.

Key words: pandemic crisis, labor model, employment, open unemployment, latent unemployment, working hours, risk zones.

Introduction

Each coming crisis generates a surge of fears about unemployment growth. This was the case during the socio-economic transformations of the 1990s, in 2009, and in 2015. The latest crisis, triggered by the coronavirus pandemic, was no exception. In the spring of 2020, when the crisis was just beginning to unfold, the first alarmist forecasts were made. According to the Chairman of the Accounts Chamber of the Russian Federation A. Kudrin, in 2020, the unemployment rate was expected to increase three-fold (up to 14%)¹. A similar forecast (growth up to 12%) was given by the Center for Strategic Research². In accordance with B. Kagarlitsky's scenario, announced on March 27, 2020 in an interview with REGNUM Agency, unemployment could cover more than 20% of the economically active population. Under these conditions, the country was expected to disorganize all socio-economic processes because unlike Western economies with a developed infrastructure of protection against unemployment, Russia is not ready for a surge in mass unemployment³.

The fears, associated with the rise in unemployment rates, are understandable. Extensive world experience shows that a sharp increase in cyclical unemployment during crisis periods, as a rule, is not accompanied by an equally rapid "absorption" of free labor into the economy after overcoming the recession [1; 2]. There is evidence that such an asymmetric reaction is also typical of the pandemic period [3]. There is a danger that some of those who lost their jobs during the pandemic will "remain" in a state of unemployment for a long time or even leave the workforce. Numerous studies confirm the hypothesis of the formation of the so-called unemployment scars, which further negatively affect both the competitiveness of employees and the state of health, psychological stability and overall life satisfaction [4; 5; 6]. We have established that the presence of unemployment period in the labor history increases the likelihood of being out of work again in the future [7]. The deterioration of labor market conditions has particularly dangerous long-term consequences for young people, as it reduces the likelihood of forming a successful labor career. Recent studies have proved that the risk was actualized during the pandemic [8; 9; 10]. According to a number of authors, representatives of older age groups who experience the greatest difficulties in finding a new workplace in job loss are among the most vulnerable ones [11; 12].

¹ Anti-crisis measures. *RBC*. April 13, 2020. Available at: <https://www.rbc.ru/economics/13/04/2020/5e9425fa9a794785f7eee788> (accessed: May 10, 2021).

² The main trends by the beginning of June 2020. Available at: <https://www.csr.ru/upload/iblock/951/951c865f5c2064bfb7d4cfb68647693.pdf> (accessed: May 10, 2021).

³ The unemployment growth will be followed by the collapse of the welfare state – forecast. *REGNUM.RU*. March 27, 2020. Available at: <https://regnum.ru/news/economy/2897782.html> (accessed: May 10, 2021).

At the same time, a sharply negative attitude toward unemployment, rejection of this natural attribute of the market economy, is perhaps more typical of Russia than of Western countries that have been developing in the market paradigm for several centuries. In Russia, an alternative socio-economic system was established for almost a century, the most important achievement of which was the sustainable maintenance of full employment and guaranteed the right to work for every resident of the country. Perhaps it was this circumstance that greatly contributed to the formation of a very specific labor model in the post-Soviet period. Its typical feature is employers' unwillingness to resort to layoffs when their demand for labor declines [13; 14].

We should note that the crisis we are experiencing today is different from cyclical and transformational crises. It is based not on fluctuations in the economic situation, but on administrative restrictions that are inevitable in the conditions of the pandemic – long-term quarantine measures, the economic consequences of which are felt to varying degrees depending on the type of economic activity, socio-demographic features and characteristics of national cultures. The actions of the state to mitigate negative consequences also play a huge role.

Russian government has promptly taken emergency measures to support employment and well-being level. Enterprises in the types of activities, most affected by the spread of coronavirus infection, received subsidies for the payment of wages if at least 90% of employees were retained. According to the Commissioner for Entrepreneurs' Rights at the President of the Russian Federation B. Titov, about a third of small business entities used such subsidies during 2020⁴. At the same time, the possibilities of obtaining the unemployed status and the right to benefits in the maximum amount were expanded; material support program for families

with children was launched. These measures made it possible to avoid a massive drop in incomes and social outburst in an extremely difficult situation.

The features of the Russian labor model, on the one hand, and the specifics of the current crisis, on the other, suggest that its impact on the labor sphere may differ from the usual consequences of crisis recessions of economic activity and modify labor relations. The reaction of this most important sphere for human development to the changed realities of socio-economic life needs to be understood. The purpose of the article is to trace changes in the world of work during the coronavirus pandemic, to establish the features of the spread of unemployment including its latent forms, and to identify risk zones to which it is advisable to direct the focus of public policy. The scientific novelty of the work lies in the study of the non-standard situation in the world of work that has appeared against the background of the pandemic crisis development.

Approaches and methodology of the research

The main research hypothesis follows from the peculiarities of the Russian labor model that determine employers' behavior in reduced labor demand. This model is characterized by the predominant use of internal flexibility reserves, rather than the numerical adaptation mechanisms typical of most Western economies, associated with the dismissal of employees from enterprises and, ultimately, with a decrease in the total number of employees and rising unemployment. Administrative leave, transfer to part-time and, not least, various models of wage savings traditionally serve as such reserves. Wide opportunities for reducing labor costs with a minimal reduction in the number of employees in Russian conditions are opened by the low share of the guaranteed tariff part in the salary structure and the prevalence of gray schemes for paying part of earnings even to officially hired employees [15].

We can assume that it is precisely these mechanisms that help to minimize the practice of layoffs and prevent the employment reduction that

⁴ <https://www.rbc.ru/economics/31/05/2021/60b2c15a9a7947b7ddaa75fb> (accessed: August 20, 2021).

employers actively resorted to in the conditions of the rising restrictions on economic activity. Accordingly, the main research hypothesis is that the dynamics of standard indicators of employment and open unemployment, which are most often used to assess the situation on the labor market, should remain fairly calm. At the same time, the indicators of working hours and latent unemployment could react much more sharply.

The research method is economic and statistical analysis based on the available data of Rosstat official statistics characterizing the labor sphere development. Since these data are subject to significant fluctuations depending on the time of year and month, in order to offset the influence of the seasonal factor, as a rule, we compare data not with the previous period, but with the corresponding period of the previous year. Such measure helps to trace the impact of the pandemic more clearly. The results of operative independent research are also used for analysis including the express survey of the Centre for Labour Market Studies (CLMS) at the HSE “Work and employment in the epidemic”, monitoring of socio-economic indicators of the Center for Strategic Research.

Research results

Basic indicators of the labor market: employment, unemployment, labor force participation. The most accurate employment statistics are available for large and medium-sized enterprises that provide information on the number of jobs, filled by workers on payroll (WPR), external part-timers (EPT) and under civil contracts (CC). As *Table 1* shows, employment in this economic segment did not undergo significant changes during the pandemic crisis development. On average, in 2020, the total number of replaced jobs reached 33.5 million people, which is higher by 205 thousand people than the corresponding indicator in 2019.

Rosstat data don't support the forecast of the Center for Strategic Research published in June, according to which a sharp (more than double) employment growth based on CC should be expected by the end of 2020⁵. Apparently, on the one hand, it was based on an extrapolation of the 2019 trend, on the other – on expectations that in uncertainty among employers, the desire to transfer employees from indefinite contracts to flexible employment conditions will increase. In reality,

Table 1. Employment dynamics at large and medium-sized enterprises (compared to the corresponding period of the previous year)

Period	Ratio of the number of replaced jobs (2020/2019, %)			
	WPR	EPT	CC	Total
March	101.7	101.2	106.1	101.8
April	100.6	98.8	90.1	100.3
May	100.6	98.8	90.1	100.3
June	100.1	96.8	90.8	99.8
July	100.2	99.7	98.4	100.2
August	99.7	102.3	94.9	99.6
September	99.8	102.5	95.6	99.7
October	99.8	102.8	95.9	99.8
November	99.9	101.6	98.0	99.9
December	99.9	102.1	98.4	99.9
Year	100.7	100.1	96.8	100.6

According to: Socio-economic situation of Russia. 2020. Section “Employment and unemployment”. Available at: https://gks.ru/bgd/regl/b20_01/Main.htm

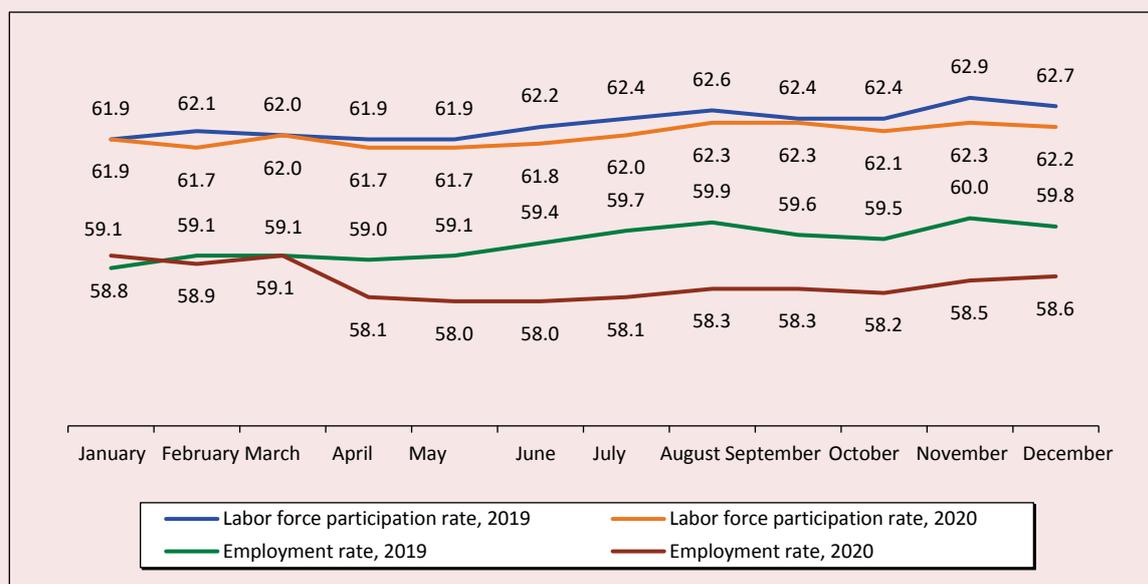
⁵ The main trends by the beginning of June 2020. Available at: <https://www.csr.ru/upload/iblock/951/951c865f5c2064bfb7d-4cfb68647693.pdf> (accessed: May 10, 2021).

however, at large and medium-sized enterprises, on the contrary, there was a slight decrease in the proportion of workers, employed on non-standard conditions. In other words, at least in this economic sector, the desire to preserve labor teams seems to have prevailed, and employers solved the problems of declining demand for labor (where they arose) at the expense of the periphery of the internal labor market without affecting the core staff⁶. From the macro-level perspective, these problems were small, as the number of permanent staff remained relatively stable, and the “flexible buffer” of Russian labor markets still amounts to 1.3–1.4 million people in full-time equivalent.

At the same time, we should remember that large and medium-sized businesses, for which fairly detailed administrative statistics are collected,

provide less than half of the total employment of the country’s population. A more complete description of the employment dynamics is given by the monthly of Rosstat labor force survey (LFS)⁷. From April 2020, its results have recorded a small but steady decline in total employment compared to the corresponding period of 2019. Thus, the employment reduction mainly affected the small business sector, where flexible, non-standard forms of employment and informal labor relations are widespread. The labor force participation rate experienced a more modest decline compared to the employment rate (*Figure*). This means that most of those who lost their jobs were in no hurry to leave the labor market and were actively looking for a new one. This conclusion is confirmed by the results of the independent studies⁸.

Labor force participation rate and employment rate, %



Source: Rosstat data.

⁶ It is worth noting that such a strategy was chosen by large enterprises not only in Russia, but also in most EU countries, in the UK and the USA, which are usually characterized by a sharper reduction in employment, compared to Russian labor market in response to the deterioration of economic conditions [16].

⁷ Until 2016 – “Population survey on employment problems”. From the first quarter of 2016, the name was changed to “Labor Force Survey”.

⁸ According to the results of the CLMS HSE express survey, the share of those who remained in the labor market after losing their jobs was about 70%. Available at: <https://econs.online/articles/ekonomika/karantinnaya-ekonomika-i-rynok-truda/> (accessed: June 10, 2021).

The key indicator of the state of the labor market is open unemployment level, measured according to the methodology of the International Labor Organization, has stabilized at 6.3% since mid-summer 2020, which roughly corresponds to the indicator pre-crisis year in 2008 (before a small surge in unemployment during the 2009–2010 crisis). Since November 2020, its steady decline has resumed continuing to the present. Thus, against the background of alarming expectations, the average Russian indicator of open unemployment remained within socially safe values and turned out to be lower than in most European countries⁹.

At the same time, the expansion of material support for the unemployed through the employment service, coupled with the simplification of registration procedures¹⁰, led to an increased influx of unemployed citizens to employment centers and an unprecedented increase in registered unemployment. Compared with the corresponding period of 2019, the coverage of the unemployed by state support measures reflected by this indicator has grown to unprecedented proportions. If before the pandemic, no more than a quarter of the total number of unemployed were registered with the employment service, then in the second quarter of 2020, almost two-thirds received state support, and in the third – almost three-quarters of the unemployed. It is true that so far the additional support is mostly passive, but the question has already been raised about the need to reform the employment service, expand its capabilities to provide real assistance in improving the competitiveness of workers and finding decent work¹¹.

⁹ According to the International Labor Organization, the average unemployment rate in the Eurozone countries in 2020 was 8.2% including Spain – 15.7, Greece – 16.9, Italy – 9.3%.

¹⁰ The maximum amount of benefits for those who lost their jobs during the epidemic was increased to 12,130 rubles in Russia and to 19,000 rubles in Moscow. This upper limit, roughly corresponding to the level of the subsistence minimum, will remain at least until the end of 2021.

¹¹ <https://mintrud.gov.ru/employment/employment/784> (accessed: May 10, 2021).

Despite the relatively low and stable unemployment rate, recorded by the LFS, in the perception of both the population and the authorities, job loss has been identified as one of the most significant risks generated by the pandemic¹². In our opinion, this may be the result of several circumstances.

First, the territorial factor plays an important role. The singularity of the last crisis lies in the non-standard changes in the unemployment situation across the country. It has hit the traditionally prosperous metropolitan regions relatively hard, where the proportion of employed in the most affected types of economic activity as a result of the pandemic is high. Due to both the structural features of the economies of Moscow and St. Petersburg, and the fact that they were at the pandemic epicenter, it was here that the demand for labor experienced the greatest shock reduction. At the same time, open unemployment rate, although it did not reach objectively high values, increased most sharply compared to other regions.

Throughout the observation period, Moscow and Saint Petersburg were characterized by an abnormally low unemployment rate. The situation here can be described as overemployment. Over the previous decade, the unemployment rate in Moscow has never exceeded the 2% mark, and in some years it was less than 1%. In St. Petersburg, after a “surge” to 2.1% in 2015, the unemployment rate fell almost lower than in Moscow.

In 2020, according to the criterion of minimizing unemployment, the metropolitan regions for the first time in the entire post-Soviet period lost their firmly held first places in the rating giving way to oil-bearing autonomous districts. The unemployment rate in Moscow and Saint Petersburg approached 4%. In itself, this is not much. However, if the outsider regions have long

¹² The irrationality of these fears is clearly illustrated by the data of the latest survey of the SuperJob portal in 2021, according to which 33% of respondents expressed fear of losing their jobs, which is twice as high as the proportion of those worried about health (17%).

adapted to the high unemployment rate, and their population has developed survival strategies, then in regions with consistently high demand for labor, the new situation is perceived very acutely.

It is also important that the deterioration of the labor market conditions in the metropolitan regions negatively affected not only on their permanent population, but also the vast contingent of migrant workers from other regions of Russia, whose earnings ensured the households' well-being in a very wide geographical reference. In addition, due to the geographical location and infrastructure opportunities, it is easier for the population of the capitals to broadcast their employment problems, interests and concerns to the central media and government structures.

Second, the crisis caused a shift in the vulnerability zones in the context of categories of workers and types of economic activity. As *Table 2* shows, along with the hotel and restaurant business, the types of activities, where workers with highly developed human potential are concentrated, are among the leaders in terms of unemployment growth. The sharpest surge in unemployment was recorded in culture, which has not just high, but often elite human potential. Thus, among the victims of unemployment were representatives of traditionally prosperous segments of the population with a high educational level, good survival skills in the market economy, who before the pandemic were quite confident in the stability of their socio-economic situation¹³.

Table 2. Changes in the unemployment rate by type of economic activity, %

Type of economic activity	Unemployment rate		
	2019	2020	2020/2019
Culture, sport, leisure time	2.7	4.6	170.4
Hotels and catering	5.6	9.4	167.9
Finance and insurance	2.7	4.1	151.9
Public administration	2.7	4.1	151.9
Information and communication	2.2	3.2	145.5
Education	2.2	3	136.4
Building	4.7	6.3	134.0
Trade, repair of vehicles	4.8	6.4	133.3
Health care and social services	1.8	2.4	133.3
Professional, scientific and technical activities	1.9	2.5	131.6
Real estate transactions	4.2	5.2	123.8
Transportation and storage	3.1	3.7	119.4
Electric power supply	2.6	3.1	119.2
Manufacturing	3.8	4.5	118.4
Extraction of mineral resources	2.8	3.2	114.3
Agriculture, forestry	5.5	5.9	107.3
Water supply	4.2	3.7	88.1
On average in the economy	4.6	5.8	126.1
According to: data from Rosstat labor force survey. Available at: https://rosstat.gov.ru/folder/11110/document/13265			

¹³ This conclusion is consistent with the results of a study, conducted by Russian economists of changes in inequality under the influence of the pandemic [17], but it differs from the conclusions of a number of Western studies, according to which representatives of traditional vulnerable categories of the population were the first to lose their jobs and experienced the most noticeable drop in income: low-paid workers [18; 19], persons with a low level of education [20; 21], representatives of national minorities [18; 22].

The situation in healthcare is also of particular concern, where, despite the increased demand from population, unemployment growth is higher than the average in the economy. We should note that according to the LFS data on the consolidated item “activities in the field of health and social services”, an absolute increase in employment compared to the corresponding period last year was not recorded in any of the quarters. Thus, the analysis of statistics indicates a dangerous curtailment of regular medical care not only due to the redistribution of resources to the coronavirus control zone, but also due to forced interruptions in professional activities of some medical personnel of “not-Covid” profiles.

Third, inconsistency of objective indicators of the unemployment dynamics and the perception of the situation by the population may be related to the features of the methodology, adopted in the world community for counting the unemployed, developed by the International Labour Organization (ILO), which Rosstat adheres to when conducting surveys of the workforce. According to this methodology, persons who have worked at least one hour during the control week for any remuneration, as well as temporarily absent from work for various reasons, are considered employed. Thus, those who, having lost a permanent job, nevertheless had one or another part-time job and those who actually did not work while on forced leave or in idle time, but formally retained their workplace, do not fall into the category of unemployed¹⁴.

We can also assume that the opportunities for part-time work in metropolitan regions and large cities are wider than the national average. In this case, the standard indicator of unemployment rate additionally shifts the distribution of the surge of unsatisfied labor supply in the direction

of the regions downplaying the real severity of the issue in the capitals, since it does not take into account people who have lost their main job, but have retained secondary employment. Thus, the dynamics of open unemployment rate may not reflect real changes in the demand for labor. At the same time, labor market agents (both employees and employers) feel these changes and broadcast their concerns through the media and other feedback mechanisms to the authorities.

Working hours and latent unemployment. Taking into account the commitment of the Russian labor market to the mechanisms of functional rather than numerical adaptation, we can assume that in crisis times, the problems of the labor sphere can be largely latent. Therefore, along with widely used indicators of employment and open unemployment, a more detailed view of the change in aggregate demand for labor allows obtaining data on working hours available from the LFS for the full circle of the employed population.

As *Table 3* shows, compared with a very modest reduction in the number of the employed, the drop in actual time worked at the lowest point of the crisis was much more extensive. This fully confirms the assumption that Russian employers prefer flexible mechanisms of adjustment to the changing demand for labor. In April 2020, compared to the corresponding period of the previous year, the actual time worked was only 73.3%, having decreased by more than a quarter. After that, a gradual recovery of economic life began, accompanied by an increase in demand for labor. In May, the lag in the indicator of working hours decreased to 80.8% from the previous year level, and in June the corresponding indicator was already more than 90%, in the third quarter the indicators almost came close to pre-crisis values. The specific indicators also changed accordingly: the average length of the working week in April reached a minimum of 28.5 hours compared to 38.2 hours in April 2019, i.e. the gap was almost 10 hours.

¹⁴ This, in particular, explains the excess of the share of those who lost their jobs according to independent surveys (10–13% of respondents) over the official unemployment rate according to the ILO, which is calculated by Rosstat (Sociodigger. 2020. August. Vol. 1. Issue 1: *Labor and employment*. P. 56).

Table 3. Dynamics of working hours

Month	Hours worked per week							
	Total hours (thousand)		Dynamics		Per employed		Per actually working	
	2019	2020	Difference (thousand)	2019/2020 (%)	2019	2020	2019	2020
January	2698500	2699568	1068	100.0	37.9	37.8	39.0	38.9
February	2727378	2718607	8771	99.7	38.2	38.2	39.2	39.2
March	2729663	2723571	6092	99.8	38.2	38.2	39.1	39.2
April	2726586	1999305	727281	73.3	38.2	28.5	39.2	37.9
May	2696628	2177803	518825	80.8	37.7	31.1	38.8	38.3
June	2710890	2474445	236445	91.3	37.7	35.3	39.3	38.9
July	2650233	2541945	108288	95.9	36.7	36.2	39.2	39.3
August	2660738	2552138	108600	95.9	36.7	36.2	39.1	39.0
September	2742603	2654626	87977	96.8	38.0	37.7	39.3	39.0
October	2743192	2657671	85521	96.9	38.1	37.8	39.2	39.1
November	2770854	2655689	115165	95.8	38.1	37.6	39.2	39.0
December	2764886	2676093	88793	96.8	38.2	37.8	39.2	39.2

According to: data from Rosstat Labor Force Survey. Available at: <https://rosstat.gov.ru/folder/11110/document/13265>

At the same time, if we calculate the average workload of the population actually working (excluding those who were temporarily absent from work for various reasons), the gap in the average length of the working week, compared to the corresponding period of the previous year, is reduced to minimum values. In April, when the decline in economic activity was the deepest, the average working week of the actually working population was 37.9 hours, which is only 1.1 hours less than the corresponding indicator in 2019. It

follows from this that the transfer to a reduced work schedule was used much less actively compared to different variations of forced vacations. This reflects a situation where the trigger for limiting economic activity is not insufficient demand, as in a standard crisis, but administrative bans caused by the pandemic.

The information available from the LFS on the actual duration of working hours helps to give more accurate estimates of the real scale of unemployment, the ratio of its open and hidden forms. If we

Table 4. Dynamics of the number of the employed and those who actually worked in 2019–2020, thousand people

Month	Employed		Temporarily absent		Actually working			
	2019	2020	2019	2020	2019	2020	Δ 2019–2020	2019/2020 (%)
January	71229	71361	2042	1932	69187	69429	242	100.3
February	71488	71124	1871	1835	69617	69289	-328	99.5
March	71488	71382	1693	1850	69795	69532	-263	99.6
April	71387	70233	1781	17414	69606	52819	-16787	75.9
May	71555	70035	2124	13145	69431	56890	-12541	81.9
June	71968	70067	2927	6469	69041	63598	-5443	92.1
July	72222	70229	4694	5508	67528	64721	-2807	95.8
August	72476	70495	4493	5054	67983	65441	-2542	96.3
September	72207	70482	2503	2490	69704	67992	-1712	97.5
October	72083	70314	2142	2382	69941	67932	-2009	97.1
November	72669	70723	1927	2642	70742	68081	-2661	96.2
December	72425	70772	1946	2523	70479	68249	-2230	96.8

According to: Rosstat Labor Force Survey data. Available at: <https://rosstat.gov.ru/folder/11110/document/13265>

adjust the number of employees taking into account persons who were temporarily absent from work¹⁵, the resulting dynamics of the number of the actually employed roughly corresponds to the trajectory of changes in hours worked, recording a sharp decline in the last months of the second quarter and a gradual recovery in the subsequent period with a slight pullback in the fourth quarter with the beginning of the second pandemic wave (*Tab. 4*).

There is always a certain number of people who have a job, but are temporarily absent from the workplace; and it is due to various reasons, the most common of which are annual leave and sick leave. At the same time, a significant increase in this category of workers, compared to the usual values, most likely indicates an increase in latent unemployment, an approximate estimate of the extent of which is reflected in *Table 5*.

According to our estimate, at the most acute point of the crisis, latent unemployment exceeded open unemployment by more than three times. Thus, every fourth was covered by unemployment (either in open or latent form). At the same time, all indicators of working hours indicate that

the employment failure was sharp and deep, but relatively short-lived, and most of the workers, affected by latent processes, are likely to have returned to their former jobs. The second pandemic wave in autumn-winter period no less severe than the first one in terms of the health of the country's population, brought significantly less economic damage due to changes in the policy of regulating economic activity.

Discussion of the results: implications for economic policy

Both from the point of view of economic consequences and from the point of view of the individual life situation, open and latent unemployment have significant differences. The main one is that the latent unemployed preserve the connection with the enterprise or organization, therefore, if we take into account the social consequences for the employee, latent unemployment is much less dangerous compared to open, especially if the unemployment period is not prolonged for a long time. At the same time, maintaining excessive employment is one of the key markers of an inefficient economy.

Table 5. Dynamics of open and latent unemployment in 2020

Month	Unemployed		Redundant temporarily absent*		Open and latent unemployment	
	Thousand people	Rate	Thousand people	Rate	Thousand people	Rate
January	3482	4.7	-110	-	3482	4.7
February	3425	4.6	-36	-	3425	4.6
March	3485	4.7	157	0.2	3642	4.9
April	4286	5.8	15633	21.0	19919	26.7
May	4513	6.1	11021	14.8	15534	20.8
June	4606	6.2	3542	4.7	8148	10.9
July	4731	6.3	814	1.1	5545	7.4
August	4808	6.4	561	0.7	5369	7.1
September	4777	6.3	-13	-	4777	6.3
October	4694	6.3	240	0.3	4934	6.6
November	4616	6.1	715	0.9	5331	7.1
December	4433	5.9	577	0.8	5010	6.7

* Excess of the indicator of temporary absence from work compared to the corresponding period of the previous year.
According to: data from Rosstat Labor Force Survey. Available at: <https://rosstat.gov.ru/folder/11110/document/13265>

¹⁵ In this case, we are not talking about transferring to remote employment, but about interruptions in the exercise of labor activity for one reason or another.

From this point of view, we should evaluate the anti-crisis program. Its epicenter includes measures of centralized employment support in those areas of activity where the need for workers has significantly decreased. The immediate social effect of such measures is associated with situational support for that part of the economically active population that is faced with the risk of losing their jobs and, accordingly, income from employment. The allocation of state subsidies to enterprises for the payment of wages, subject to the preservation of labor collectives, can be considered as one of the indirect mechanisms to ensure the so-called unconditional basic income. Today, the belief is gaining stronger and stronger positions that in economies claiming to be socially oriented, every member of society should have the right to such an income [23; 24; 25].

In the strategic perspective, the effect of the programs may be associated with the preservation of national human potential, the quality of which in modern conditions is the leading factor for economic success and national competitiveness. The mechanisms of human potential development through the acquisition of useful knowledge and skills in the course of work are no less important today, and perhaps even more important than the basic set of competencies, obtained in the system of formal vocational education. The dynamic development of new technologies and, accordingly, the changing requirements of employers to employees determine the constant renewal of human capital of the latter. It is no coincidence that the presence of work experience in a particular field of activity for employers, as a rule, is more important than the grades of a university diploma, and often the rating of the university where this diploma was obtained [26]. Not being used in the course of work, knowledge and skills are gradually lost, accumulated human capital degrades and depreciates [27], therefore, the attitude to maintaining employment

in general works to preserve not only specific labor collectives, but also national human potential as a whole.

At the same time, government subsidies, aimed at maintaining employment, can keep inefficient business structures afloat and slow down the processes of economic restructuring. Consequently, decisions on the provision of such assistance should be made based not only on the current social significance, but also on an assessment of the possible scale of human capital losses in a particular field of activity. Today, many enterprises of domestic small businesses have not achieved decent work standards, informal labor relations are widespread, business survival is achieved by saving on ensuring social security of personnel [28]. In such a situation, open unemployment, which contributes to the renewal of this sector, is preferable to hidden.

During crises, there is always a “sanitization” of business environment, the death of those structures whose leaders have insufficient managerial competencies: they are not able to predict market conditions, calculate risks, and conduct a competent personnel policy. This process should not be slowed down, but directed, on the one hand, by creating incentives for entrepreneurs to move into more promising economic niches, on the other – by developing a system of social shock absorbers that allow employees to feel more confident in the external labor market. Scandinavian countries have been following this path for quite a long time having developed a special model of socially protected flexicurity in the labor market¹⁶. The model is based on a combination of relatively low guarantees for the preservation of a particular workplace with the development of a comprehensive support system for working population including insurance of job

¹⁶ The term originated on the basis of the merger of two initially considered contradictory concepts: “flexibility” as a condition for entrepreneurial freedom and effective economic development and “security” as a key principle of the welfare state.

loss risks and multifaceted mechanisms to promote employment and strengthen the competitiveness of job seekers [29; 30]. Currently, this model has spread far beyond Scandinavia and is being actively tested in Eastern European countries [31; 32]. In a situation when, under the influence of radical technological shifts and changes in the general context of socio-economic life caused by the pandemic, there is a dynamic restructuring of the entire system of labor relations, the concept of socially protected flexibility becomes even more relevant. It seems that borrowing such an approach to building a policy on the labor market would be very useful for Russia as well.

Important guidelines for the formation of employment policy, taking into account the realities of the current situation requiring flexible regulatory mechanisms, have been developed by the International Labour Organization. The key positions are contained in the Resolution promptly adopted in June 2021 at the 109th Session of the International Labour Conference on the global call to action for human-oriented recovery after the COVID-19 crisis. The main priorities are as follows: ensuring a favorable environment for the development of viable enterprises including micro, small and medium-sized enterprises, as a source of employment; increasing national employment services and national employment policy; strengthening public and private investments in vocational training and lifelong learning, ensuring effective access to vocational training, including apprenticeship, vocational guidance, advanced training and retraining programs, as well as other measures of active labor market policies and partnerships to reduce imbalances, gaps and shortages of professional skills; using opportunities for a fair digital and environmental transition to promote decent work. Of particular concern to the ILO is the issue of ensuring decent work for young people in order to maximize their potential as a source of dynamism, talent, creativity and

innovation and as a driving force in shaping a better future in the field of work¹⁷.

In conditions of reduced demand for labor, the Russian labor model, focused on the preservation of labor teams, reduces the chances of young workers just starting to build a career. By making efforts to minimize layoffs, enterprises are drastically reducing the hiring of new employees. As a result, graduates of professional educational institutions who face the problem of transition from study to work fall under the impact of the pandemic crisis.

In light of this circumstance, the guidelines to form the employment policy, proclaimed in the Resolution, could not be more relevant. Active employment promotion programs related to strengthening competitiveness in the labor market, which are in line with the concept of lifelong learning, should receive special priority. To implement them, it is advisable to rely on the infrastructure of employment services. The first steps in this direction have already been taken. For people who lost their jobs during the pandemic, Federal Labor and Employment Service of Russia together with the organization "Worldskills Russia" has developed a special program of vocational training and retraining in a wide range of specialties. Access to the program was opened on the portal "Work in Russia". During 2020, 110 thousand people from 85 regions took advantage of the program¹⁸. Back in 2019, with the ILO support, a program of modernization of the employment service began to work in order to convert services and services into electronic form, to provide services depending on the needs of a citizen through

¹⁷ Resolution concerning the global call to action for a human-centered recovery from the COVID-19 crisis that is inclusive, stable and sustainable (June 17, 2021). ILC.109/Resolution I. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_808850.pdf (accessed: August 20, 2021).

¹⁸ <https://worldskills.ru/nashi-proektyi/akademiya-worldskills/programmyi-massovoj-podgotovki-postandartam-vorltdskills/express-maket.html> (accessed: August 20, 2021).

interdepartmental interaction with other bodies. In 2020, flagship employment centers of a new type providing remote access to services were established in 41 regions, this year their number should increase to 61, and by 2024 the program will cover all regions of the country¹⁹.

Nevertheless, the increase in the attractiveness of employment services during the pandemic has so far been mainly due to an increase in the scale of financial support for the unemployed. It seems that their role in the process of adjusting the social and labor sphere to changing economic realities could be strengthened by the transition from autonomous regional employment services to a single federal structure capable of effectively coordinating measures at the national economic level to promote employment and update professional knowledge and skills of employees, as well as returning the status of civil servants to employees of employment centers, ensuring decent pay for their work and adequate dynamic changes in the tasks they are facing, related to continuous learning opportunities. Further reform of this structure, of course, will require organizational and financial efforts, which, however, can bring tangible economic and social effects in the near future.

Conclusion

The study helps to confirm the relevance of the Russian labor model, which was formed in the last decade of the past century, in modern realities. It is precisely the peculiarities of this model that are largely due to the fact that, from the point of view of the dynamics of macroeconomic proportions, the labor sphere as a whole has successfully coped with the challenges of the pandemic crisis: open unemployment and employment rates have remained within quite acceptable limits, the sector of large and medium-sized enterprises has managed to maintain almost pre-crisis employment. The

key mechanism of adaptation of enterprises to the reduction in demand for labor was the reduction of working hours, which led to a sharp increase in the latent unemployment rate.

The assessment of the trajectory of the surge in latent unemployment, carried out on the basis of the LFS data, showed that at the peak of the crisis, the latent unemployment rate exceeded the open rate by more than three times. Unemployment, either in an open or latent form, had an impact on every fourth employee. At the same time, despite the fact that the second pandemic wave turned out to be tougher from an epidemiological point of view, its negative impact on the labor sphere has become less severe. The latent unemployment, accumulated during the first wave, had almost completely dissipated by September.

At the same time, serious shifts have taken place in the usual structure of the crisis decline in demand for labor and the redundancies. The key risk factors for job loss were the need for direct contact with the consumer when carrying out a particular type of activity and the presence of obstacles to switching to distance working. Geographically, the crisis has most affected large cities with a large stratum of the middle class. As a result, along with the traditional risk groups, the highly skilled and educated layers of the labor force employed in key sectors of intangible production, who, at least for the past two decades, have felt quite confident in the labor market and have become accustomed to a fairly high stability of their socio-economic situation, have suffered significantly. Such a development of events aggravated the painful perception of the crisis, created a “new package of obstacles” to the formation of the Russian middle class and jeopardized the preservation and reproduction of elite segments of national human potential.

The response features of the labor sphere to the pandemic crisis make it possible to conclude that in Russian conditions, there is a high risk of preservation of the outdated structure of the

¹⁹ <https://mintrud.gov.ru/employment/employment/784> (accessed: August 20, 2021).

economy, which may receive an additional impetus with the further orientation of state support measures to preserve jobs. A more promising strategy is to expand and strengthen the system of social shock absorbers that allow employees to feel more confident in the external labor market. It should be developed in line with the concept of socially protected flexibility combining insurance of the risk of job loss with an active policy of promoting employment and strengthening the competitiveness of job seekers. Its core should be a wide range of available training and retraining.

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Mismatch between the Level of Training of IT Personnel and the Requirements of Employers: Problems and Solutions



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Abstract. The availability of qualified IT specialists is an important factor that contributes to the development of the digital economy. The need for personnel training for the IT industry is stated in the national project “Digital economy of the Russian Federation until 2024”. Educational organizations are an important source that supplies IT specialists for the economy. However, today there is an acute problem of inconsistency between the educational system and the labor market. The aim of the study is to identify problems of non-compliance of the level of IT personnel training with the requirements of employers, and to determine ways to address these problems (on the example of the Vologda Oblast). Using the data from the Ministry of Science and Higher Education of the Russian Federation, we analyze the number of graduates in information technology-related fields in the Vologda Oblast. We also review educational programs at universities of the region and reveal problems in the formation of professional

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competencies in students. Based on the results of a survey conducted in 2020 by VoIRC RAS, we have obtained information on the compliance of the level of competencies in graduates of IT specialties with the requirements of employers in the IT industry. In the final part of the article we highlight problems related to personnel training for the IT industry of the region and outline main ways to address them. Scientific novelty of our work consists in the application of a system-wide approach that help us study the viewpoints widespread in the education system and among employers, in order to identify problems related to the training of in-demand personnel for the IT industry. The materials of our study can be used by researchers, postgraduates and students who deal with the issues of digital economy development and those related to the staffing of this industry. Practical significance of our work lies in the fact that our proposals for solving the problems under consideration can be used by federal and regional authorities and management bodies, when it would be necessary to adjust plans for the implementation of national projects “Digital economy” and “Education”; our proposals should also be the basis for goal-setting and reflected in the tasks of other regulatory documents in the field of education at the federal and regional levels.

Key words: digital economy, region, IT industry, IT personnel, IT personnel training.

Introduction

Currently, the transition to a digital economy is a global trend that sets out directions for the development of various economy sectors of all countries. The focus on digitalization is driven by the need to improve the competitiveness of the economy, as well as the population living standards [1; 2; 3]. In Russia, the digitalization of socio-economic processes is determined by the goals and objectives outlined in the passport of the national program “Digital Economy of the Russian Federation”, which prioritizes the creation and use of information technology (hereinafter – IT), such as artificial intelligence, internet of things, robotics, etc.¹ The need to develop the information technology industry (hereinafter – IT industry) as one of the prevailing conditions for digitalization is noted in the Strategy of the Information Society Development in the Russian Federation for 2017–2030². These circumstances indicate that the

development of the IT industry is the main factor in the transition to a digital economy in the country and the world.

It is worth emphasizing that the current level of informatization in Russia differs significantly from that in other countries. This fact is confirmed by data from various international rating agencies on the functioning of the IT industry. Despite the slight difference in the data, we can note that the leaders on the way to the information society are Singapore, Denmark, Sweden, and the Netherlands³. According to international ratings, Russia is 1.5–2 times behind the leading countries, and the gap increases every year⁴. For example, according to the World

¹ Passport of the national program “Digital Economy of the Russian Federation”. Available at: <https://digital.gov.ru/ru/activity/directions/858/>

² “On the Strategy of the Information Society Development in the Russian Federation for 2017–2030”: Presidential Decree no. 203, dated May 9, 2017. Available at: <https://www.garant.ru/products/ipo/prime/doc/71570570>

³ It is difficult to analyze the data of international rating agencies in dynamics, because the methodology for calculating the Networked Readiness Index has changed since 2019. Therefore, the earlier data are not comparable with the current data. The table shows the index values for 2019 and 2020 for a uniform presentation of information from different international rating agencies.

⁴ Networked Readiness Index 2019–2020. Available at: https://networkreadinessindex.org/wp-content/uploads/2020/11/NRI-2020-V8_28-11-2020.pdf; World Digital Competitiveness Ranking 2020. Available at: file:///C:/Users/user/Downloads/digital_2020.pdf; The Global Competitiveness Report 2020. Available at: <https://gtmarket.ru/ratings/imd-world-competitiveness-ranking>

Digital Competitiveness Ranking, in 2020, Russia has dropped three positions compared to 2019⁵.

It can be assumed that the reason Russia lags behind other countries is the lack of IT specialists. Various factors affecting the development of the IT industry are mentioned in the scientific literature, including financing, the cost of infrastructure, government policy, the taxation system, etc.⁶ [4; 5; 6]. At the same time, a significant part of researchers notes that to a greater extent the development of the IT industry is influenced by such a parameter as the availability of qualified IT specialists [7–10]. However, the analysis of various sources shows that there are two main approaches concerning the nature of staff impact on the development of the IT industry. The first is that the effective development of the IT industry depends on staffing (A.A. Safronova [4], I. Agapov [10], G.V. Zinenko [9], etc.). Representatives of the second approach, on the contrary, note that the shortage of qualified staff does not hinder its functioning (S. Akhmetov⁷, Yu. Krasil'nikova⁸, etc.). Despite the fact that the second approach is less common among researchers, the existence of opposing opinion indicates the debatable nature of the issue being raised.

The globalization of markets affects the increasing speed of technology diffusion, which, in turn, intensifies the processes of modernization of traditional industries, including the creation of new ones. All this leads to the emergence of new professions, areas of activity and leads to increased demand for qualified specialists. Currently, staffing becomes one of the main conditions for

the development of the IT industry and the digital economy as a whole. However, according to the specialists of the Information and Computer Technologies Industry Association (hereinafter APKIT), the proportion of IT specialists among the employed population in Russia as of 2019 was 2.4%. According to this indicator, the country is 1.5–3 times behind the world leaders⁹. According to the information provided by an online recruiting company, only 1.7 people apply for one vacancy, with the optimal situation when there are 4–5 resumes per vacancy and the employer has the opportunity to select the best candidate¹⁰. This situation indicates a low supply of labor and a high demand for IT specialists on the part of business. Under these conditions, according to available data, from 2010 to 2017 the number of IT specialists remained unchanged (growth was only 0.09%). APKIT experts estimate that by 2024 the demand for IT specialists will be 290–300 thousand people a year¹¹.

The current situation indicates the low staffing level in the IT industry, so the problem of training IT specialists becomes extremely relevant in the transition to a digital economy, both at the federal and regional levels, which determines the practical relevance of our study.

The purpose of the study is to identify problems of mismatch between the level of IT personnel training and the requirements of employers and to identify areas to address them (in the case of the Vologda Oblast). To achieve the goal, we addressed the following tasks: 1) to study the trends in IT personnel training in the Vologda Oblast universities; 2) to analyze educational programs of the Vologda Oblast universities in IT-related training fields; 3) to assess employers' satisfaction with the level of IT specialists training in the Vologda Oblast

⁵ World Digital Competitiveness Ranking 2020. Available at: file:///C:/Users/user/Downloads/digital_2020.pdf

⁶ Dynamics and prospects of IT industry development. Available at: <https://issek.hse.ru/news/371816718.html>

⁷ Akhmetov S. IT staff shortage: why Russia does not have enough IT pros and where to find them. Available at: <https://yandex.ru/turbo/hightech.fm/s/2020/02/17/hr-it-russia>

⁸ Krasil'nikova Yu. 84% of Russian companies experience an acute shortage of personnel. Available at: <https://hightech.plus/2018/12/04/rossiiskie-kompanii-gotovi-platit-it-specialistam-do-1-mln-rublei-v-mesyac>

⁹ Association APKIT. Available at: <https://zsrfr.ru/directway/2020/01/27/trebujutsja-itshniki-mnogo>

¹⁰ HeadHunter Index. Available at: <https://stats.hh.ru/>

¹¹ Association APKIT. Available at: <https://zsrfr.ru/directway/2020/01/27/trebujutsja-itshniki-mnogo>

universities (according to the survey); 4) to highlight problems and outline directions to promote IT personnel training.

Scientific novelty of our work lies in the application of a system-wide approach that help us study the viewpoints widespread in the education system and among employers, in order to identify problems related to the training of in-demand personnel for the IT industry. Its use involved a reference to various sources of information, such as the data of the Ministry of Science and Higher Education of the Russian Federation, educational programs of universities in the Vologda Oblast, as well as the results of a survey among employers of IT companies.

Theoretical aspects

The role of personnel in the development of the IT industry is noted both among experts and in scientific literature. For example, experts of the Internet Initiatives Development Fund point out that in the next 10 years, as a result of the large-scale digitalization of industries, the need for IT specialists will grow¹². Employees of the Agency for Strategic Initiatives (hereinafter – ASI) emphasize that the availability of professionals with IT competencies is an important factor on which the effective functioning of the IT industry depends¹³. The role of personnel in the implementation and use of IT is also discussed in [8; 11]. As emphasized in the studies [9; 10], the impact of the national project “Digital Economy” on the need for IT specialists is obvious, because IT development is rapid and

it is used in different segments. The prevalence of these processes strengthens the role of personnel specializing in different areas of IT.

Before proceeding to consider the problem of staffing, it is necessary to indicate how this concept is interpreted in scientific works. The results of our study [12] show that there are two main approaches to the concept of staffing among experts – resource-based and process-based (*Tab. 1*).

In accordance with the purpose and objectives of the work, we take into account the concepts of both approaches. One should note that the process is a specific sequence of steps aimed at achieving a result. In this regard, the professionalism and competence of the trained specialist depends on how effectively personnel training activities will be organized, which determines the need to use the concepts of the process-based approach. On the other hand, resource provision, in particular personnel, will affect the dynamics of the IT industry. In this case, it is important to adhere to the concepts of the resource-based approach.

As mentioned above, the transition to a digital economy requires qualified IT specialists. The problem of staff shortage is being discussed at the state level, as well as among experts. In this regard, it seems reasonable to consider how Russian IT business representatives themselves assess the staffing level. The analysis allowed distinguishing three main approaches. The first approach considers the supply of specialists, paying attention to the existing staff shortage in the IT industry. The second

Table 1. Approaches to defining the concept of staffing

Approach	Content of the approach
Process-based	A time-consuming process that is carried out using a set of methods and tools for training and providing them to organizations, in accordance with the needs of the economy (S.A. Spilberg, N.M. Antoshina, O.V. Basharina)
Resource-based	One of the main resources that allow production to function and meet the quantitative and qualitative characteristics of the needs of organizations (O.V. Binert, N.Y. Anisimova, N.N. Barchan, A.A. Kotov, A.P. Chumachenko)
Compiled according to: [13–17].	

¹² Human resources in the age of digital economy. *RIA Novosti*. Available at: <https://ria.ru/20191230/1562653998.html>

¹³ Atlas of Emerging Jobs. Available at: https://www.skolkovo.ru/public/media/documents/research/sedec/SKOLKOVO_SEDeC_Atlas.pdf

approach is based on the demand for IT personnel, which is connected not so much with the shortage of specialists as with the lack of jobs for them. Representatives of the third approach say that it is impossible to unambiguously assess staffing [10].

The study of approaches showed the highest prevalence of the first position, which is associated with a lack of IT specialists to implement the changes, their inadequacy to meet the requirements of employers. It is worth noting that this point of view is confirmed by the use of indicators. In the course of the study we found that the main indicator, which allows assessing the staffing level, is the ratio of the actual number of specialists to the planned need [12]. Internet recruitment company data show that demand exceeds supply twofold, and that there is an increase in the need for personnel. If in 2019 APKIT experts estimated the need for personnel by 2024 at 290–300 thousand people a year, in 2021 the deputy head of the Ministry of Digital Development, Communications and Mass Media reported that the shortage of IT specialists has already reached 500 thousand to 1 million people a year¹⁴. Thus, with the dynamic development of the IT industry, with continuing trends, the problem of a shortage of specialists will be exacerbated.

Educational organizations are an important source of human resources reproduction. However, today they do not cope with the task effectively enough, as evidenced by the opinions of representatives of the IT business, universities and other experts. According to the head of an IT company, today there is a lack of graduates in IT-related professions. In addition, educational institutions give students only the basics (often outdated)¹⁵. This point of view was also expressed by a specialist from another IT organization,

¹⁴ Russia has a severe shortage of IT specialists. Available at: https://www.cnews.ru/news/top/2021-02-17_v_rossii_katastroficheskij

¹⁵ On the situation with the shortage of IT staff. Figures and facts. Available at: <https://www.itweek.ru/business/article/detail.php?ID=209736>

which noted that universities acquire only basic knowledge, which is insufficient to solve current professional problems¹⁶. The results of the auditing company¹⁷ study show that among the main barriers for companies ready for digitalization are the lack of necessary competencies and the lack of IT literacy in employees¹⁸.

Despite the presence of a large number of scientific studies devoted to the topic of imbalance between the educational system and the labor market, there are still debatable aspects [18–21]. For example, A.N. Kochetov, Doctor of Sciences (History), Professor at the Department of Sociology and Public Relations of Saratov State Social and Economic University, notes that there is no complete clarity about the imbalance, there are different assessments of the situation. In some cases, personnel shortages are attributed to a reduction in the workforce. In addition, arguments prevail that specialists with higher education diplomas are in sufficient demand and their need is determined by the nature of the current Russian economy¹⁹. While there is a gap between the needs of employers and the skills of students and graduates, it is not severe²⁰. G.A. Klyucharev and Yu.V. Latov emphasize: it is impossible to say that the situation concerning the correspondence of the received knowledge to the employers' requirements is very bad, only every fourth university graduate doesn't work in the specialty they have been trained in [22]. The

¹⁶ IT specialists are indeed in short supply. Available at: <https://vc.ru/hr/107883-it-specialistov-deystvitelno-ne-hvataet-eksperty-rasskazali-o-sprose-na-it-specialistov>

¹⁷ KPMG is one of the world's "Big Four" accounting firms. The acronym in the organization's name consists of the first letters of the last names of the founders of the independent accounting firms that joined KPMG.

¹⁸ Digital technologies in Russian companies. KPMG research, 2019. Available at: <https://assets.kpmg/content/dam/kpmg/ru/pdf/2019/01/ru-ru-digital-technologies-in-russian-companies.pdf>

¹⁹ Kochetov A.N. Vocational education and the labor market: problems of interaction. Available at: <http://ecsocman.hse.ru/data/2011/09/20/1267450955/Kochetov.pdf>

²⁰ Race for personnel. Available at: <https://spb.plus.rbc.ru/news/5afbcf187a8aa93e43d3c4ba>

presence of different points of view determines the scientific significance of the conducted research.

The variety of approaches suggests that there is no consensus on the problem of a qualitative and quantitative gap between the demand for IT personnel and their supply both on the part of educational institutions and the labor market. This actualizes the need for further research in this area; in this regard, consideration of the problems of training IT specialists is extremely important. As the study of theoretical aspects showed, despite the relevance of the issues of staffing of the IT industry, there are not many scientific works on this topic, especially related to the regional level. The issue is mostly raised in the authorities and among representatives of IT companies. Consequently, our research contributes to the study of the problems of staffing as such. In addition, its results can be used in the study of this issue at the regional level.

Methods and information base of the study

In order to implement the purpose and objectives of the study, we used a systematic approach, which consisted in a comprehensive study of the problem raised. For this purpose, we presented theoretical aspects of the problem of staffing, analyzed trends in the training of IT specialists from the quantitative and qualitative side, considered the issues of IT staff qualifications compliance with the requirements of employers, and highlighted the main problems of training for the IT industry and directions for their solution.

We used a combination of scientific methods to conduct the study. Using the statistical method, we analyzed the number of IT graduates. In order to identify common and different features in the change in the number of graduates at different levels of education (bachelor's degree, specialist degree, master's degree), as well as to compare training areas related to IT, we used the method of comparative analysis. Along with this, the method of comparative analysis was used to review scientific literature in the study of theoretical and

methodological aspects of the problem under consideration. The method of empirical research, based on the survey (questionnaire), was used to obtain information about employers' satisfaction with the competence level of IT specialties graduates. Based on the methods of generalization and synthesis, we identified the problems that exist in the training process for the IT industry.

The data of the Ministry of Science and Higher Education of the Russian Federation (the number of graduates in IT-related fields in the Vologda Oblast) served as the information base for the study. The information provided by the Ministry includes the period from 2013 to 2019, which limits the possibilities for comparative analysis. In addition, to study the problems of forming students' professional competencies, we used undergraduate and graduate educational programs in IT training areas, published on the websites of Vologda State University (VSU) and Cherepovets State University (ChSU). Their analysis was based on available data for the period from 2016 to 2018. Also, in order to obtain information on the compliance of the competences' level of IT specialties' graduates with the requirements of employers, we used the results of the survey of IT company managers²¹.

The choice of the object of our research is due to the fact that the Vologda Oblast is a typical region of the Russian Federation in terms of readiness to the information society. In 2016, the Ministry of Digital Development, Communications and Mass Media, as part of the study of information society development in the regions of the Russian Federation, for the first time published a rating of the subjects by the level of informatization. In 2017, a comparative rating was presented, according to

²¹ The survey was conducted in 2020 by the Vologda Research Center of the Russian Academy of Sciences. A list of IT-companies of the Vologda Oblast was compiled for monitoring on the basis of OKVED (61. Activity in the field of telecommunications; 62. Development of computer software, consulting services in this area; 63. Activities in the field of information technologies).

which more than half of the regions of the Russian Federation showed an increase in the values of the index of readiness to the information society²². The Vologda Oblast took an average position in terms of readiness to the information society, the index values increased only in one year. Since the rating data have not been updated over the past 2–3 years, our study will be based on the available data.

In addition, according to the information of the Internet recruiting company, 82% of employers in the IT field are looking for specialists mainly with a completed higher education [12], in this regard the problems of personnel training in the Vologda Oblast are considered on the data of educational institutions of higher education.

Research results

One should note that the situation at the regional level is similar to that at the federal level. The Vologda Oblast is also experiencing a serious lack of personnel in the IT industry. In 2018, this indicator was one and a half times lower than the Russian average. For the period from 2010 to 2018, the number of IT personnel remained virtually

unchanged (growth by 0.29 p.p.). In conditions of high demand, the problem of IT-specialists shortage is most acute. One of the sources of staff reproduction is educational organizations. The need for IT specialists influences the increase in demand for graduates in IT-related fields of study.

Analysis of the data of the Ministry of Science and Higher Education of the Russian Federation (hereinafter – the Ministry) showed that the Vologda Oblast universities train personnel in only eight IT areas, while in the Russian Federation there are 12 such areas. Despite the course taken in 2016–2017 to build a digital economy in the country, training in a number of areas has ceased. For example, the Vologda Oblast universities did not conduct training in “Business informatics”, “Infocommunication technologies and communication systems” (internal study mode) in 2019, while it was previously conducted. There is a decrease in the number of undergraduate graduates in such educational programs as “Applied mathematics and computer science” (7%), “Applied computer science” (27.3%), “Business informatics” (72.4%), etc. (Tab. 2).

Table 2. Number of graduates from educational organizations of the Vologda Oblast in IT-related bachelor's degree programs, people

Educational program	2013			2015			2017			2019		
	e	i	m	e	i	m	e	i	m	e	i	m
Applied mathematics and computer science	-	0	-	-	14	-	-	9	-	-	13	-
Business informatics	-	0	-	-	29	-	-	8	-	-	-	-
Applied computer science	0	0	-	0	11	-	8	0	-	9	8	-
IT security	-	0	0	-	6	18	-	15	-	-	14	-
Information and communications technologies and communication systems	-	0	0	-	0	0	-	9	0	-	-	-
Computer science and engineering	0	0	-	26	22	-	35	21	-	34	24	-
Information systems and technologies	0	0	0	-	35	0	-	16	6	-	16	-
Software engineering	-	0	-	-	15	-	-	15	-	-	14	-
Total	0	0	0	26	132	18	43	93	6	43	89	-

Note: e – external study mode; i – internal study mode; m – mixed attendance; 0 – no graduates; “–” – training in this field was not conducted (here and in Tab. 3–4).
Compiled according to: data from the Ministry of Science and Higher Education of the Russian Federation. Available at: <https://www.minobrnauki.gov.ru/ru/activity/stat/highed/index.php> (here and in Tab. 3–4).

²² On monitoring the development of the information society in the constituent entities of the Russian Federation. Ministry of Digital Development, Communications and Mass Media. 2017. Available at: http://tomedu.ru/wp-content/uploads/2015/02/Vopros_8_Rejting.pdf

Master's degree students in the Vologda Oblast were trained in only four IT disciplines on an internal study mode basis. The number of graduates increased by 63.6% over 2013–2019. In the context of specialties, their growth is also observed, except for “Applied mathematics and computer science” (decline by 27.3%; *Tab. 3*).

The training of IT students in the Vologda Oblast universities was also carried out only on an internal study mode basis in three areas and only through to 2015, while the total number of graduates decreased by 47% (*Tab. 4*). The decrease in the number of specialists is associated with Russia's transition to the Bologna system of education, which caused a decrease in the admission quotas for specialist degree programs. According to enrollment campaigns, since 2015 the Vologda Oblast universities have not recruited applicants for specialist degree programs in IT-related fields, so the reduction in the number of specialist degree graduates is associated with the graduation of students from the previous years and the lack of new applicants.

The proportion of IT training areas in the total number of all specialties in the Vologda Oblast universities remains at a low level, despite an

insignificant growth from 2013 to 2019. Thus, in 2019 the proportion of IT directions from all educational programs in the Vologda Oblast was 4.1% (external study mode), 9.4% (internal study mode) and was absent in mixed attendance mode.

Thus, the data of the Ministry show that there are problems in the system of training of specialists for the IT industry in the Vologda Oblast. First, the processes of digitalization and IT diffusion are characterized by the emergence of new professions, which imposes requirements for the emergence of new areas of training in educational organizations. However, during the period under consideration the list of IT specialties in the region's universities has not undergone any changes. Second, despite the growing demand for IT specialists, their training stopped in such undergraduate areas as, for example, “Business informatics” and “Information and communications technologies and communication systems”. Third, the proportion of training areas for the IT industry in the total volume of all specialties is extremely small. Given the decrease in the number of graduates in the IT field, as well as the above-mentioned factors, the current situation indicates the inability of the education system to cover the growing demand for IT specialists.

Table 3. The number of graduates from educational organizations of the Vologda Oblast in IT-related master's degree programs, people

Educational program	2013			2015			2017			2019		
	e	i	m	e	i	m	e	i	m	e	i	m
Applied mathematics and computer science	-	11	-	-	9	-	-	14	-	-	8	-
Computer science and engineering	-	8	-	-	8	-	-	14	-	-	10	-
Information systems and technologies	-	3	-	-	5	-	-	10	-	-	6	-
Software engineering	-	0	-	-	6	-	-	2	-	-	12	-
Total	-	22	-	-	28	-	-	40	-	-	36	-

Table 4. The number of graduates from educational organizations of the Vologda Oblast in IT-related specialist degree programs, people

Educational program	2013			2015			2017			2019		
	e	i	m	e	i	m	e	i	m	e	i	m
Applied mathematics and computer science	-	25	-	-	17	-	-	-	-	-	-	-
Applied computer science	6	32	-	-	-	-	-	-	-	-	-	-
Information systems and technologies	-	11	-	-	19	-	-	-	-	-	-	-
Total	6	68	-	-	36	-	-	-	-	-	-	-

Along with the shortage of IT personnel, the problem associated with the quality of their training is widespread. This is evident from the analysis of the formation of students' professional competencies, which was carried out with the use of educational programs on IT directions of universities in the Vologda Oblast. The methodology and stages of the analysis of educational programs were presented earlier [23].

The results of the analysis of undergraduate educational programs in IT training areas of universities in the region indicate the greatest emphasis on the development of competencies of design and industrial-technological (service-operational) activities. This is confirmed by the fact that each of the educational programs of the

Vologda Oblast universities accounts for more than 37.8% of the hours aimed at developing the professional competencies of this group from all other groups (with equal development – 33%). At the same time, a number of educational programs lack the focus on the formation of analytical and organizational-managerial activity competences (Tab. 5). This indicates that there are prerequisites for unequal development of different groups of professional competencies among students of the Vologda Oblast universities.

An important aspect in the process of specialist training is practice as an opportunity to implement the knowledge obtained in the university. A significant part of the educational programs for IT training areas of universities in the Vologda Oblast

Table 5. Overview of educational programs in IT specialties in universities of the Vologda Oblast (bachelor's degree)

University	Educational program	PCG1, %	PCG2, %	PCG3, %	Proportion of practice in disciplines with PC*, total, %
01.03.02 Applied mathematics and information technologies					
VSU	Applied mathematics and information technologies	58.5	41.5	0.0	25.1
ChSU	Mathematical and information support of socio-economic processes	75	0	25	14.0
09.03.01 Information technologies and computer science					
VSU	Computers, complexes, systems and networks	46.7	53.3	0.0	13.7
	Software for computer facilities and automated systems	52.0	48.0	0.0	10.2
09.03.02 Information systems and technologies					
VSU	Information systems and technologies	26.9	59.0	14.1	11.2
ChSU		10.7	89.3	0.0	15.4
09.03.03 Applied information technologies					
VSU	Applied information technologies in economics	18.6	44.1	37.3	15.4
09.03.04 Software engineering					
VSU	Software and information systems development	37.8	37.8	24.3	14.8
ChSU		53.7	39.0	7.3	23.0
10.03.01 Information security					
ChSU	Security of computerized systems	21.9	56.3	21.9	14.0
11.03.02 Communication technologies and systems					
ChSU	–	11.6	55.8	32.6	15.8
<p>Note: PCG1 – competencies of research (experimental) activities; PCG2 – competencies of design, production and technological activities; PCG3 – competencies of analytical, organizational and managerial activities. * The proportion of hours of practical classes that develop professional competencies (PC) of the student, from the total number of hours of an educational program (here and in Tab. 6). Compiled according to: Information about educational programs of VSU. Available at: https://vogu35.ru/sveden/education. Information about educational programs of ChSU provided by official request.</p>					

has a low degree of practice orientation – the proportion of training hours is less than 16.7%²³.

A similar situation is observed in the master's program, the only exception is the development of competencies of research (experimental) activities (more than 47.8% of academic hours). This correlates with the objectives of the master's degree to form theoretical knowledge and skills of research activities. A number of educational programs of master's degree, as well as bachelor's degree are less related to the development of competencies of analytical, organizational and management activities. There is also a low level of practice orientation. Only one ChSU program 09.04.04 "Software and information systems development" has a high degree of practical orientation compared to the rest (37.4%; *Tab. 6*).

Thus, the study of the qualitative side of IT specialist training on the basis of educational programs in IT areas of universities in the Vologda Oblast allowed concluding the following. First, there is an uneven distribution of opportunities for the formation of students' professional competencies in different groups. If at the undergraduate level

the emphasis is made on the development of design and production-technological (service-operational) competences, then at the master level – on the research (experimental) ones. At the same time, the competences of analytical and organizational-management activity are developed to a lesser degree both in bachelors and masters.

Second, the master's degree allows deepening of specialization in the chosen direction, if it does not change after studying at the bachelor's degree [24]. However, in the context of entering a master's program in another direction, the continuity between educational programs is violated and the master's program cannot form all the necessary professional competencies in two years [23].

Thirdly, there is a low level of practice-oriented educational programs in the IT areas of universities in the Vologda Oblast, both in the master's and bachelor's degree programs.

These problems are identified as a part of a system-wide approach, considering different positions. In educational organizations students are given basic knowledge in a particular specialty, which is deepened in the work activity, specific

Table 6. Overview of educational programs in IT specialties of Vologda Oblast universities (master's degree)

University	Educational program	PCG1, %	PCG2, %	PCG3, %	Proportion of practice in disciplines with PC*, total, %
01.04.02 Applied mathematics and information technologies					
VSU	Mathematical modeling	28.6	39.3	32.1	9.8
09.04.01 Information technologies and computer science					
VSU	Distributed and automated systems	59.3	40.7	0.0	6.7
	Control and computing systems	100.0	0.0	0.0	5.9
09.04.02 Information systems and technologies					
VSU	Multimedia technologies	47.8	32.6	19.6	10.6
09.04.04 Software engineering					
VSU	Software and information complexes	52.9	47.1	0.0	5.0
ChSU	Software and information systems development	64	36	0	37.4
Compiled according to: Information about educational programs of VSU. Available at: https://vogu35.ru/sveden/education . Information about educational programs of ChSU provided by official request.					

²³ In the educational programs about 50% of the academic hours of the discipline is allocated for independent work, and the remainder is evenly distributed on classroom lessons – lectures, practice and laboratory. Based on this, it can be assumed that the disciplines in which more than 25% of the academic hours are devoted to practical classes, have a high degree of practice-oriented, from 25 to 16.7% – average, and less than 16.7% – low.

skills are acquired according to the requirements of a particular enterprise. In this regard, based on the survey conducted in 2020 by VolRC RAS, it seems reasonable to consider how the knowledge and skills obtained in the Vologda Oblast universities are evaluated by employers in the IT area.

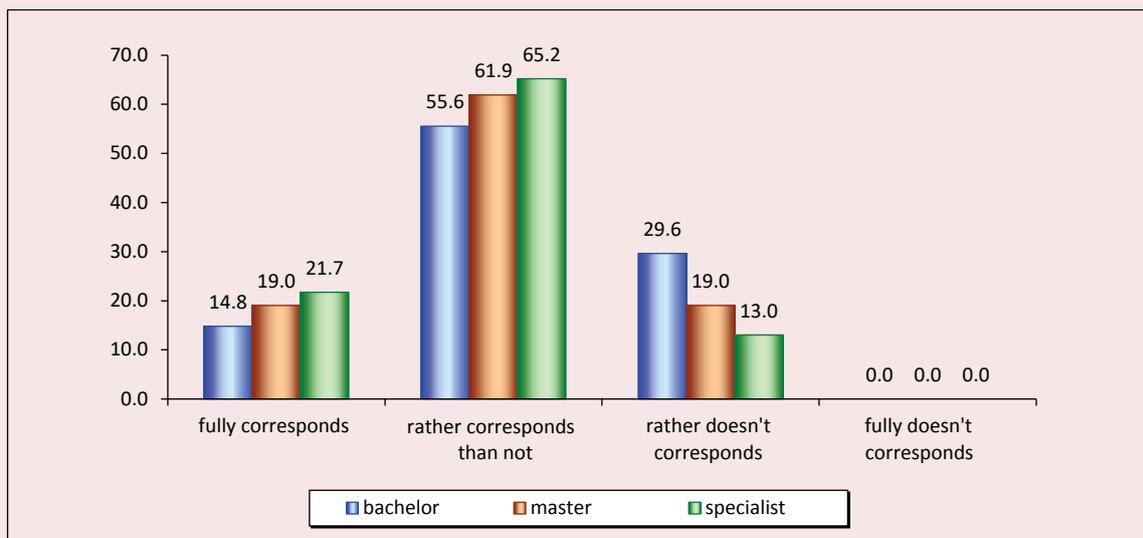
Thus, the heads of IT companies in the Vologda Oblast were asked to assess the degree of conformity of knowledge and competencies of the personnel who completed their training (bachelor's degree, master's degree, specialist degree) in the universities of the Oblast, employed over the past two years. Almost one third of the respondents are inclined to believe that the degree of IT specialist's qualification "rather does not correspond". A similar position is common among those who hired bachelors – 29.6% (Fig. 1). Respondents most highly evaluated the qualification of IT specialist – graduate with a Specialist Degree. Thus, 65.2% of the respondents indicated that their qualification "rather corresponds than not", 21.7% – "fully corresponds". The quality of

knowledge of specialists is the most appreciated by employers. However, in the last few years the Vologda Oblast universities do not recruit applicants for specialist programs in IT.

The survey conducted among managers of IT companies made it possible to assess the development level of different groups of professional competencies of Vologda Oblast universities graduates from the point of view of employers. The development of competencies of analytical activity was evaluated by every fifth person with 3 points, 17.2% with 4 points on a ten-point scale. The responses about the level of development of organizational and managerial competences were similarly distributed. Every fourth has assessed them as 4 points, 17,7% of the respondents – 3 points.

Every third respondent described the level of development of project activity competencies as 4 points. Every fifth IT-company manager assessed the level of development of R&D competencies as 5 points, the same proportion of respondents gave 7

Figure 1. Distribution of answers to the question "How would you assess in general the extent to which the qualifications of an IT specialist (graduate of a Vologda Oblast university) meet the requirements of the workplace of your organization?", % of respondents



Source: own compilation according to the survey results.

Table 7. Distribution of answers to the question about assessing the level of graduates' development of different groups of professional competencies, % of respondents

Professional Competence Group	Point									
	1	2	3	4	5	6	7	8	9	10
Analytical competencies	0	0	19.0	17.2	10.5	13.8	15.7	17.0	3.4	3.4
Organizational and managerial competencies	0	0	17.7	24.3	15.6	10.3	13.8	10.0	4.9	3.4
Project activity competencies	0	0	3.0	27.6	14.0	10.3	17.2	17.0	6.9	3.4
Competencies of research (experimental) activities	0	0	3.0	17.3	20.7	13.8	20.7	17.0	0	6.9
Competences of industrial-technological (service-operational) activities	0	0	0	24.3	10.3	13.8	13.8	31.0	3.4	3.4

Source: compilation according to the results of the survey.

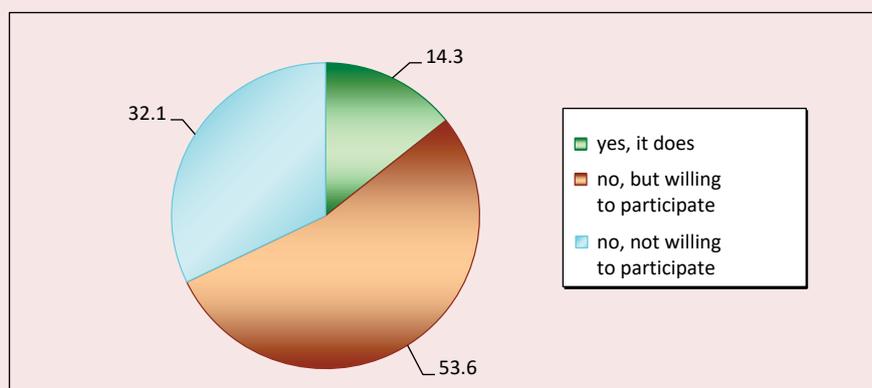
points. The highest score was given by respondents to the level of development of competencies of production and technological (service and maintenance) activities. Almost one third of the respondents (31%) gave the development level of this group of professional competencies 8 points (Tab. 7).

The level of development of analytical, organizational and managerial competencies among the graduates of the Vologda Oblast universities is below average. The focus on the development of these groups of professional competencies in the educational programs of the region's universities, related to IT training, is expressed to a lesser extent, which indicates the regularity and interconnectedness of these trends.

Another contradiction is that, despite the importance of analytical thinking as one of the main competences for IT specialists²⁴, this very group of professional competences is practically not formed by the students of universities in the Vologda Oblast.

An important tool to address the above problems is the organization of dual education system – the interaction of universities with IT companies as a way to overcome the mismatch between the field of education and the labor market [25]. Most of the respondents (53.6%) indicated that this model is not implemented in their organizations, but expressed their willingness to cooperate with universities in the Vologda Oblast. About 14.3% of the heads of IT companies noted that they participate in the dual education system (Fig. 2).

Figure 2. Distribution of answers to the question "Does your organization participate in the dual education model with the universities of the Vologda Oblast?", % of respondents



Source: own compilation according to the survey results.

²⁴ Atlas of Emerging Jobs. Available at: https://www.skolkovo.ru/public/media/documents/research/sedec/SKOLKOVO_SEDeC_Atlas.pdf

One of the factors restraining the interaction between universities and companies is the financial factor. Employers state that organizations have no financial opportunities for cooperation and it is very costly and burdensome to participate in such cooperation unilaterally²⁵. The mobility of personnel, the possibility of changing their specialization and place of work, as well as the inability of companies to provide employees with full employment or decent career growth do not stimulate investment in personnel development. In this case it is inexpedient for companies to invest in training a person who is “difficult to retain”²⁶.

The non-participation of companies in dual education projects partially explains the fact that in half of the cases employers note the absence of graduates participating in the dual education project in the company staff. However, almost every third IT company managers who have such employees say

that the quality of professional training of graduates is significantly different for the better, hence they have the potential to be developed (Fig. 3).

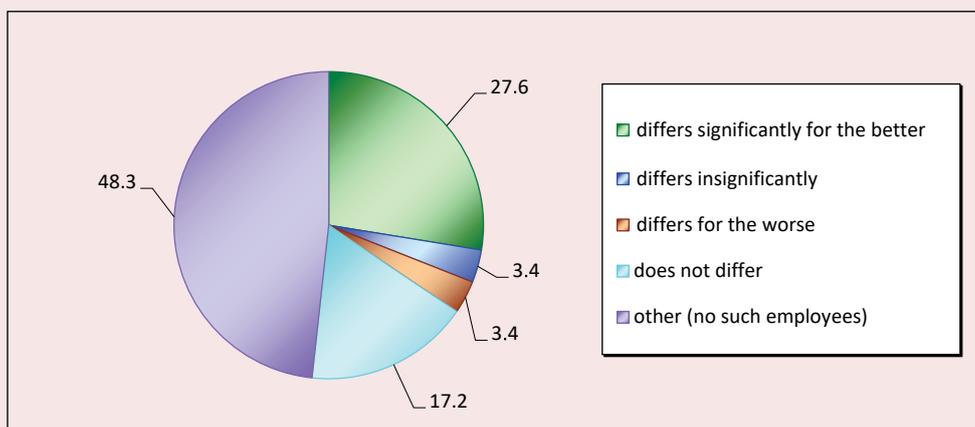
Thus, the results of the survey of IT managers confirmed the conclusions that the knowledge and skills of Vologda Oblast university graduates do not meet the requirements of employers, which subsequently leads to the lack of demand for IT specialists in the labor market. The problem of staffing will be exacerbated in the conditions of a reduction in the number of graduates in IT directions.

Problems and solutions

The analysis allowed distinguishing a number of problems, which characterize the ineffectiveness of the education system and require a solution.

Problem 1: The mismatch between the current list of specialties in higher education institutions and the challenges of the digital economy and the processes of informatization.

Figure 3. Distribution of answers to the question “If your organization employs an IT graduate who is a participant of the dual education project, is the quality of his/her professional training different compared to the graduates who did not participate in the dual education system?”, % of respondents



Source: own compilation according the survey results.

²⁵ Employers and educational institutions: how to achieve interaction? Available at: <https://vologda.hh.ru/article/22034>; Zarubin V.G., Savin I.V., Tumalev V.V. What prevents the employer from interacting with the university: the experience of the study of stereotypes. Available at: <http://www.ibl.ru/konf/041208/67.html>

²⁶ The master stays out of the picture. Available at: <https://rg.ru/2020/09/30/v-rossii-nabiraet-populiarnost-dualnaia-forma-obucheniia-studentov.html>

It would be advisable to initiate the adjustment of the list of training areas for IT specialties in accordance with the needs of employers. And it is possible to do this at the level of the Ministry of Science and Higher Education of the Russian Federation. Key areas could be those related to data analysis, machine learning, Big Data, virtual and augmented reality technologies, cybersecurity, robotics, quantum computing, blockchain, etc. The training process must be flexible and be able to be adjusted immediately when the need arises, without postponing the process, otherwise the mismatch between the level of training and the requirements imposed by new technological challenges will persist.

Problem 2: The low share of IT training in the total volume of all specialties

In order to solve the problem, it is necessary to expand the range of areas of training in the direction of IT specialties due to the emergence of new areas of training relevant to the digital economy. A number of areas not directly related to IT (mathematics and mechanics, physics, engineering, etc.) can be adapted to the requirements of digitalization and informatization processes through the use of digital and information technology in the learning process to develop digital literacy in future professionals.

Problem 3. There is a general decreasing trend in the number of graduates of universities in IT-related fields

It is necessary to increase the admission quotas, primarily in the areas of training related to computer science, information science, information security, etc., as well as in promising areas. The growth of admission quotas requires an increase in the number of applicants. It is important that educational organizations form demand by conducting career guidance work already at the stage of school education. For this purpose, one can organize specialized classes with in-depth study of IT, holding open days in IT organizations, lectures by teachers

and professors of leading universities in the region for schoolchildren on the possibilities of applying knowledge in the field of IT, etc. In addition, the experience of the Vologda Oblast showed that there is a certain mismatch between the regulatory framework at the regional and federal levels; in the passport of the federal project "Personnel for the Digital Economy", which is implemented as part of the national program "Digital Economy of the Russian Federation", the indicator "the number of admissions to higher education programs in IT and mathematical specialties", and its annual target values is designated; in a similar passport of the regional level (Vologda Oblast) this parameter is missing. Consequently, it is necessary to eliminate the discrepancies in the legislative documents of different levels.

Problem 4: Uneven distribution of groups of professional competencies, the formation and development of which is the focus of the educational. Mismatch between the current list of professional competencies developed in students and the challenges of the digital economy

The solution to the problem can be associated with the development of methodological recommendations, which would adjust the hours of disciplines to ensure equal development of different groups of professional competencies in students. This will allow preparing IT specialist comprehensively and form all the necessary competencies. Considering the requirements of employers, first of all, it is necessary to increase the proportion of hours for the development of analytical and project activity competences, since the focus on the formation of analytical and organizational and managerial competences is missing in a number of educational programs. This is partly due to the fact that every third respondent characterized the level of development of project activity competencies among graduates at 4 points on a ten-point scale.

It is necessary to consider adjusting the list of professional competencies, as stated in the FSES (Federal State Educational Standards), to include such competencies as critical thinking, analytical thinking, creativity, cognitive flexibility, adaptability. In addition, it would be appropriate to specify each group of professional competencies in more detail for each IT direction and training profile with an indication of the abilities formed within their framework.

Problem 5: Low level of practice-oriented educational programs in IT training areas

It is possible to address this issue by a more even distribution of academic hours of courses so that the proportion of practical training is not less than 16.7% of academic hours (in accordance with the structure developed in the article). To reduce the problem of mismatch between the skills obtained by graduates in universities and the requirements of the labor market, it is important to involve representatives of IT business in the organization and conduct of student internships. Such cooperation will allow training specialists whose knowledge, skills and abilities will be really in demand in the labor market.

Problem 6: Breakdown in continuity between educational programs at different levels

It is advisable to change the approach to graduate admission to a master's degree program by retaining the educational program after graduation from the bachelor's degree, which will help avoid breakdown in continuity while forming competencies at different levels.

Problem 7: The low level of interaction between universities and the real economy

It is important to explore the possibility of implementing the mechanism of dual education system at the state level. One should note that the Strategy for socio-economic development of the Vologda Oblast for the period through to 2030

emphasizes the need for cooperation between educational institutions of higher education and the real sector of the economy. However, such cooperation is limited only by the creation and development of an information platform²⁷. Thus, as of today, the possibility to implement the dual education system is not enshrined in the normative framework.

It is advisable to develop measures at the federal level to stimulate universities and companies for cooperation. This is possible through creation of legal conditions for companies to invest in equipment and infrastructure, and for universities to provide facilities and maintain them in good working order, and to introduce evaluation mechanisms for educational services. It seems important to reduce information asymmetry, which implies, among other things, building a system for assessing labor market needs (conducting regular surveys) and creating an information system linking entities of educational and professional spheres.

The implementation of dual education system can help to find solutions to a number of problems outlined above. The interaction of universities with IT companies will allow forming a relevant and demanded list of IT specialties in educational institutions, adjusting the list of necessary professional competencies, educational programs, so that their content and requirements for the results of their study correlated with the requirements of employers, etc.

In addition, it is advisable to implement the mechanism of employer-sponsored education through the conclusion of a contract between a student with the participation of the educational organization, where the training is planned, and

²⁷ "On the Strategy for socio-economic development of the Vologda Oblast for the period through to 2030": Vologda Oblast Government Decree no. 920, dated October 17, 2016. Available at: <https://vologda-oblast.ru/upload/iblock/cfe/strategiya2030.pdf>

the enterprise-employer, which guarantees a place of work. In 2020, the Governor of the Vologda Oblast announced the allocation of 200 places for employer-sponsored education at the expense of the regional budget in the in-demand areas of training, including computer science and computer technology. However, one should note that the applicant for employer-sponsored education must choose pedagogical specialties, hence the opportunities to participate in this model of training are limited²⁸. In this regard, it seems appropriate to expand the list of directions of IT training, relating not only to pedagogical specialties.

The implementation of employer-sponsored education can also contribute to “bringing” training in universities in line with the changing demands of society, the formation of a system of “bringing” a specialist to the workplace.

Conclusion

Thus, with the ever-growing digitalization of the economy, the human resources of the IT industry can become the main source of growth of the national economy as a whole. The rapid development of digital and information technologies leads to an increase in the demand for IT specialists, and also apply new competence requirements. One of the main sources of reproduction of human

resources is educational organizations. The analysis showed that the main problem of training specialists for the IT industry is the mismatch between the education system and the labor market. With the growing demand for IT specialists, the personnel shortage will only increase. The proposed measures to solve the problems highlighted in the study of reproduction of IT staff will provide continuity and consistency in the training of specialists.

The materials of the study can be used by researchers, post-graduate and undergraduate students dealing with the problems of digital economy development, and issues related to the staffing of this industry. The presented research is of a comprehensive nature, its results contribute to the expansion of theoretical aspects of the study of the IT training problems. The practical significance of the work lies in the fact that the developed proposals for addressing the identified issues can be used by federal and regional authorities and management in adjusting the plans for implementing the national projects “Digital Economy” and “Education”, and should also be reflected in the objectives of other legal documents in education at the federal and regional levels. Along with this, the material can be used for scientific substantiation of measures aimed at optimizing the training system of IT specialists.

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²⁸ Another 200 places for employer-sponsored education for applicants were allocated in the Vologda Oblast. Available at: https://vologda-oblast.ru/novosti/novosti_organov_vlasti/eshchye_200_mest_na_tselevoe_obuchenie_dlya_abiturientov_vydeleno_v_vologodskoy_oblasti

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Reproduction of Human Capital in the Arctic Regions of Russia: Socio-Cultural Context*



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Abstract. The formation and reproduction of human capital, as the most important prerequisite for modern development, has not only sectoral, but also regional features. The article, which continues a series of our works on human capital in the conditions of the Arctic zone of the Russian Federation, considers the influence of socio-cultural factors on human capital in the Arctic territories. The aim of the study is to present a new approach to the role of socio-cultural factors (foundations and components) in human capital development in the Arctic regions for a new (neo-industrial) stage of their exploration. In this regard, we clarify conceptual foundations of the studies on human capital presented in the works of researchers from Russia and other countries. Within a certain theoretical and methodological framework, we analyze, compare, and summarize the findings of a sociological study conducted in March – May 2018 in the Arkhangelsk Oblast (in the Arctic territories) and Yamalo-Nenets Autonomous Okrug; to this end, we use methods such as mass surveys and statistical data analysis. We provide data that characterize human capital of the Northerners in terms of their financial situation; we prove the existence of a direct dependence on regional (higher – in Yamalo-Nenets Autonomous Okrug), sectoral (especially oil and gas enterprises), socio-professional (especially managers, highly qualified specialists, state and municipal employees) aspects. With the use of multidimensional measurements, we show the interrelations and individual dependencies of the variables that characterize education, health and socio-professional status in the structure of human capital in the surveyed regions. We also focus our attention on the role of value orientations in the formation and reproduction of human capital. In conclusion, we note that the impact of socio-cultural factors on human capital is ambivalent: on the one hand, they act as a fundamental basis, on the other hand, some of them (education, work motivation, etc.) act as structural components. We propose measures aimed at strengthening national and regional policies (including investment) in the development of human capital in the Russian Arctic.

Key words: human capital, Arctic regions of Russia, socio-cultural factors, sociological approach, multidimensional measurements.

Introduction

The transition to a post-industrial economy since the early 1960s and the subsequent transition to an information society in the 21st century led to the emergence of the term “human capital”. It first appeared in economics and spread rapidly among other disciplines [1; 2; 3]. The past sixty years witnessed the development of many theories related to this category, and the authors of the fundamental ones were awarded the Nobel Prize (T. Schultz, 1979, G. Becker, 1992). Their ideas were further elaborated on not only theoretically, but also analytically and practically in the developments and methodologies of the UN, the World Bank and other international organizations. Despite the variety of approaches to interpretation of the term “human capital” and its comparison with other forms of capital, it focuses on certain qualities (including their quantitative assessment) of the worker’s personality as a source of creative and innovative productivity embodied in a modern and high-quality product [4; 5; 6]. For individual enterprises, companies, as well as for regions and entire countries, human capital is one of the main resources for boosting competitiveness and development [7; 8]. Obviously, at present, economic and social issues cannot be addressed only by improving material factors [9]. Moreover, focusing on the material aspect alone can become a certain prerequisite for national vulnerability [10]. The gap between countries in terms of the pace of innovation-driven development is growing; lagging behind can result in stagnation. In these conditions,

a strategy for modernization on an innovation basis turns out to be the only choice to Russia: either the country will take a step into the future and give an impetus to the dynamic development of its knowledge economy, for which human capital is of critical importance, or it will join the ranks of outsiders [11].

Developed countries have higher indicators of human capital compared to Russia; this can be seen in *Table 1*, which characterizes the structure of comprehensive wealth of the Russian Federation and members of the Organization for Economic Cooperation and Development (OECD). We see that with a higher proportion of natural (resources) and produced capital, human capital in Russia is more than 1.5 times lower than in OECD countries. This indicates the excessive role of natural resource rent and traditional industries in the Russian economy and a lack of knowledge-intensive industries and services provided by highly qualified specialists (IT, finance, consulting, etc.).

Table 1. Comprehensive wealth of the Russian Federation and OECD countries, 2017, %

Indicator	RF	OECD countries
Human capital	46	70
Produced capital	33	28
Natural capital	20	3
Net foreign assets	1	-1

Source: Ga'lcheva A. Human capital is gaining weight. *RBK*, 2019, December 4, no. 196. Available at: <https://www.rbc.ru/newspaper/2019/12/05/5de76fa19a79476a1ebb8bec>

In Russia, with its vast territory, extremely diverse climatic, socio-economic and socio-cultural conditions, the reproduction of human capital for modernization on an innovation basis has distinctive regional specifics [12]. At that, the issues of reproduction of human capital in the context of neo-industrial development in extreme natural and climatic conditions in the regions of the Arctic zone of the Russian Federation require special attention. The adopted Strategy for Development of the Arctic Zone of the Russian Federation

and Ensuring National Security for the Period until 2035¹ and the state program of the Russian Federation “Socio-economic development of the Arctic zone of the Russian Federation”² are aimed at a deep comprehensive analysis of the processes of formation and reproduction of human capital in the Russian Arctic.

Along with socio-economic factors, socio-cultural factors deserve special consideration, since they are not given due attention in the comprehensive analysis of human capital in the Russian Arctic regions. Based on the results of the study, we put forward new knowledge about the role of socio-cultural predicates and components of human capital in the conditions of the Far North in the case of several Arctic regions.

Research methodology, design and technique

Originating in the 1960s, the theory of human capital was developed comprehensively and has become an important response of economics and related branches of knowledge to the lingering and emerging challenges and realities of global economic life; the theory helped to develop, substantiate and implement measures aimed at investing in man and accumulating human capital [13]. Due to the huge number of publications on this subject and the limited format of the journal article, we have chosen the theoretical and methodological aspects expressed in the works of foreign and Russian researchers that we consider to be most significant for our purposes.

Modern concepts of human capital retain the original economic approach to human behavior, proposed by one of the founders of the theory, G. Becker, in the following postulates:

¹ Strategy for Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period until 2035: Decree of the President of the Russian Federation no. 645, dated October 26, 2020.

² On approval of the state program of the Russian Federation “Socio-economic development of the Arctic zone of the Russian Federation: Resolution of the Government of the Russian Federation no. 484, dated March 30, 2021.

- abilities, knowledge, professional skills, motivation become capital at the time of the purchase and sale of labor, hiring or receiving remuneration by the performer of the work;

- the growth of human capital should contribute to the growth of labor productivity and production;

- the appropriate use of capital should lead to an increase in workers' income;

- income growth encourages a worker to make investments in health and education to increase the stock of knowledge and skills in order to use them effectively afterwards [3].

With regard to these positions, human capital is interpreted in a broad and narrow sense: 1) human capital is a set of abilities in an individual that enable them to perform various social roles and functions to achieve goals in personal and socially useful activities in order to satisfy one's needs; 2) human capital is a set of abilities in an individual that create competitive advantages in work, endowing them with freedom in choosing the scope of application of their abilities to receive remuneration [14]. The above definitions emphasize various subject-subjective meanings (frames), which are important to take into account when studying socio-cultural factors, including value-motivational orientations (attitudes) and the allocation of appropriate groupings.

According to modern interpretations of human capital, it has the following properties:

- its formation requires significant costs from an individual themselves and from the social system in which an individual lives and functions;

- it can be accumulated (increased) – an individual can acquire certain skills, abilities and improve their health;

- throughout the life of an individual, it not only multiplies, but also “wears out” – knowledge becomes obsolete, as well as skills and abilities; therefore, the cost of human capital decreases (human capital is amortized);

- investment in human capital allows its owner to receive a higher income (effect) in the future;

- investment in human capital is of a long-term nature (this applies to investment in “education capital”, “profession capital”, and “health capital”);

- it differs from physical capital in the degree of “liquidity”: we cannot separate it from its bearer, an individual;

- direct income received by an individual is controlled by themselves, regardless of the source of investment;

- the functioning (use) and reproduction of human capital depends on the decisions of an individual and their own will; the degree of return on human capital depends on an individual's own interests, preferences, material and moral interest, worldview and cultural features [15].

Several of these properties are obviously related to the socio-cultural context of the reproduction of human capital, specifics of functioning of non-economic institutions in a particular society and the collective ideas and value orientations behind them. This circumstance prompted us to go beyond the econometric approach to analyzing the conditions of human capital reproduction (for more information, see [16–21]) and to search for a connection between its structural components and some variables characterizing the socio-cultural factors that influence its accumulation.

The general structure of human capital in our study is represented by several key components: health, educational, professional, and cultural capital. Each type of capital has a set of indicators; measuring them, we can determine its general level [22, p. 97]. Individual parameters corresponding to each type of capital are presented in *Table 2* (their list is deliberately limited in comparison with those found in the specialized literature, since we were interested only in those indicators that can be measured in the framework of mass population

Table 2. Structural components of human capital and their indicators

Basic component of human capital	Indicators of the basic component of human capital
Health capital	<ul style="list-style-type: none"> - physical health - emotional and mental health - the level of health care development - life safety
Educational capital	<ul style="list-style-type: none"> - general knowledge - special knowledge - self-education skills
Professional capital	<ul style="list-style-type: none"> - work experience and professional skills - organizational skills - entrepreneurial ability and experience
Cultural capital	<ul style="list-style-type: none"> - motivation for working - motivation for self-development (including self-education) - prevailing value orientations - attitude toward social norms - communication skills
Source: own compilation.	

surveys and that reflect the socio-economic and socio-professional features of individuals, self-assessment of their health, educational level and value system, as well as assessments of some environmental (spatial-territorial, regional) factors, which can be compared with expert assessments and statistical data).

Most of the indicators presented in the table are biomedical, or socio-economic according to their nature or objective function; others, referred to the parameters of “cultural capital”, reflect historically established and socially approved patterns of behavior, institutions (in the interpretation of D. North – “rules of the game”, i.e. a set of social norms that ensure communication and cooperation between individuals [23, pp. 3–10]) and the basic values of specific communities at different levels (local, regional, national).

The grounds for this approach can be found in economic and social theories that claim to describe and explain the mechanisms of “conversion” of socio-cultural features of individuals and groups into their economic behavior and its results. Thus, such foundations are rooted in the theories of classical institutionalism (T. Veblen, J. Commons) [24] and economic psychology (G. Tarde, G. Katona) [25; 26].

Within the framework of the neo-institutional approach, exploring the problems of organizational behavior and decision-making, H. Simon developed a model of economic behavior called “bounded rationality” [27]. It opens up opportunities for explaining the adoption of economic and other decisions by actors on the basis of previous social experience and norms and patterns of behavior learned during socialization, which largely depend on a certain socio-cultural environment in which the individual was formed.

Theoretical provisions on the connection of human capital with the mechanisms of human economic behavior were developed in the works of D. Kahneman and A. Tversky [28; 29], who put forward the prospect theory which is original for the methodology of behavioral economics. They show that when making economic decisions, people choose the option with the greatest psychological perspective (i.e., the highest level of psychological comfort), based on their stereotypical ideas and intuition.

Another viewpoint in understanding the connection of human capital with non-economic factors is presented by the American scientist R. Thaler, who considers the influence of people’s ideas about justice on economic behavior [30; 31].

Comprehensive studies of human capital, promotion and development of provisions on the influence of socio-cultural factors and collective ideas on economic practices fall within the scope of sociology. The beginning of this line of research was laid in M. Weber's famous work *The Protestant Ethic and the Spirit of Capitalism*. It attempts to establish a connection between the system of values derived from a specific religious doctrine and the specifics of organization of entrepreneurial activity, including the aptitude for it. The classic thesis of M. Weber's statement that the work ethic of Protestantism contributed to greater "economic rationalism" and, as a result, a higher level of entrepreneurship development in countries with predominantly Calvinist populations [32, pp. 67–69, 204–206], later, although criticized, stimulated the development of concepts of socio-cultural conditionality of economic practices and, thus, led to the study of this aspect of human capital in the works of M. Zafirovsky, R. Collins, B. Martin, V. Schluchter, M. Tamari, etc. [33, pp. 108–110].

Among the works of Russian scientists on this issue, it is necessary to highlight, first of all, the works of M.K. Gorshkov, who, within the framework of the mega-project of the study of modern Russian society, gave a deep analysis of the influence of non-economic factors on socio-economic development [9] and highlighted the socio-cultural vector of this influence [34].

Socio-cultural factors in human capital in the discourse of Russian modernization were investigated by N.I. Lapin [35]. Under his supervision, a unique project was carried out to develop and compile *The Atlas of Modernization of Russia and Its Regions*, with an original comprehensive analysis of socio-economic and socio-cultural trends and issues, which evoked a wide response in the scientific and academic community [36]. The specified work highlights issues typical of human capital at the new stage of exploration and development of Russia's Arctic zone, Extreme North, Far North and Near North.

When studying these problems, it is important to apply a geosystem approach put forward by V.N. Lazhentsev [37]; we use this approach congruently with our geo-socio-spatial methodology, in which, in addition to the study of subject-object relations in a certain geophysical (territorial) space, we investigate subject-subject relations between actors of certain social processes [38–41]. We were also interested in the ideas of N.Yu. Zamyatina and A.N. Pilyasov [42].

We took into account methodological specifics contained in the sociological analysis of the socio-cultural environment of a Northern region, presented, in particular, in the study by A.A. Shabunova and N.A. Okulova [43].

Having considered conceptual approaches, we can construct a design for the study of social practices of individuals that determine the formation and reproduction of human capital in the context of the Far North and the Arctic regions; the design allows us to identify how these practices have developed under the influence of socio-cultural factors, including attitudes and values learned earlier during socialization that stimulate and motivate individuals to take care of their health and education, appropriate investments, also related to the return on human capital and the real possibilities of converting it into income and socio-professional status.

The empirical basis for our research includes data of two mass sample surveys conducted with our direct participation almost simultaneously in the spring (March – May) of 2018 in two Arctic regions: the Arkhangelsk Oblast (in the territories included in the Arctic zone of the Russian Federation) and Yamalo-Nenets Autonomous Okrug (YNAO). At the same time, we assume that the Arctic territories of the Arkhangelsk Oblast (AO) represent a certain model of the western (European) part of the Russian Arctic, and Yamalo-Nenets Autonomous Okrug – the eastern (Ural-Siberian). The first survey within the framework of the research work "Monitoring the socio-psychological and socio-cultural situation

in the Arctic zone of the Russian Federation” was conducted among the population of six municipalities of the Arkhangelsk Oblast included in the Arctic zone of the Russian Federation (the cities of Arkhangelsk and Severodvinsk; the town of Novodvinsk; Onezhsky, Primorsky and Mezensky municipal districts). We used quota sample, representative by gender, age and area of residence; sample size $n = 407$ people; confidence interval $\leq 4.9\%$. In the second case, within the framework of the project of the Russian Foundation for Basic Research “Value and cognitive factors of entrepreneurial behavior of the population of the Arctic territories of Russia” (using the materials of the first survey and conducting its secondary analysis through targeted processing of primary data), the sample was expanded with the data from a new survey of 405 residents of the Arctic territories of the Arkhangelsk Oblast and 299 residents of Yamalo-Nenets Autonomous Okrug. As a result, with a stratified sample type, its total size was 704 people with a confidence interval of

$\leq 3.7\%$. The results were processed with the use of the SPSS program, separately for each region and for the total sample population. Comparing the results of the surveys with the data of state statistics and expert assessments allows us to draw substantiated conclusions about the problems under consideration.

In order to compare the features (indicators) of human capital with the financial situation of respondents, we conducted the procedure of self-assessment of the financial situation on a differentiated scale (*Fig. 1*).

The distribution closely correlates with statistical data and reflects significantly higher indicators of average per capita income and per capita GRP (*Tab. 3*).

The socio-professional structure of regional samples is shown in *Figure 2*. In this distribution among the respondents from Yamalo-Nenets Autonomous Okrug, in contrast to the Arkhangelsk Oblast, the proportion of those who identify themselves as pensioners is noticeably smaller,

Figure 1. Respondents' assessment of their financial situation, % for each group participating in the surveys

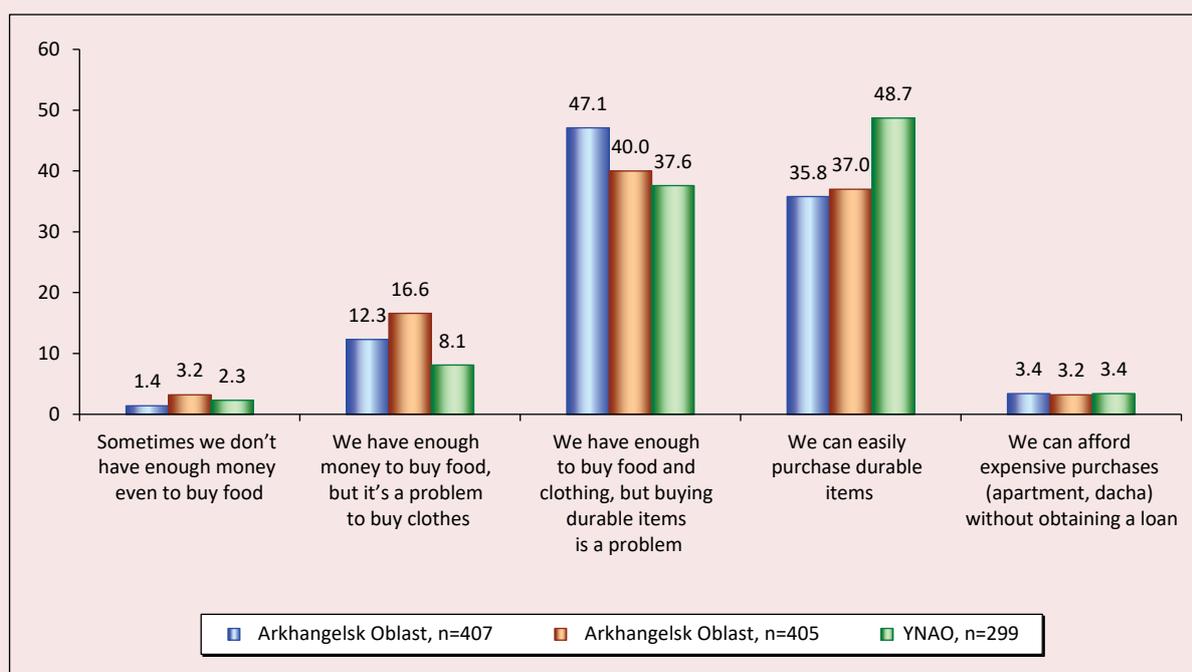
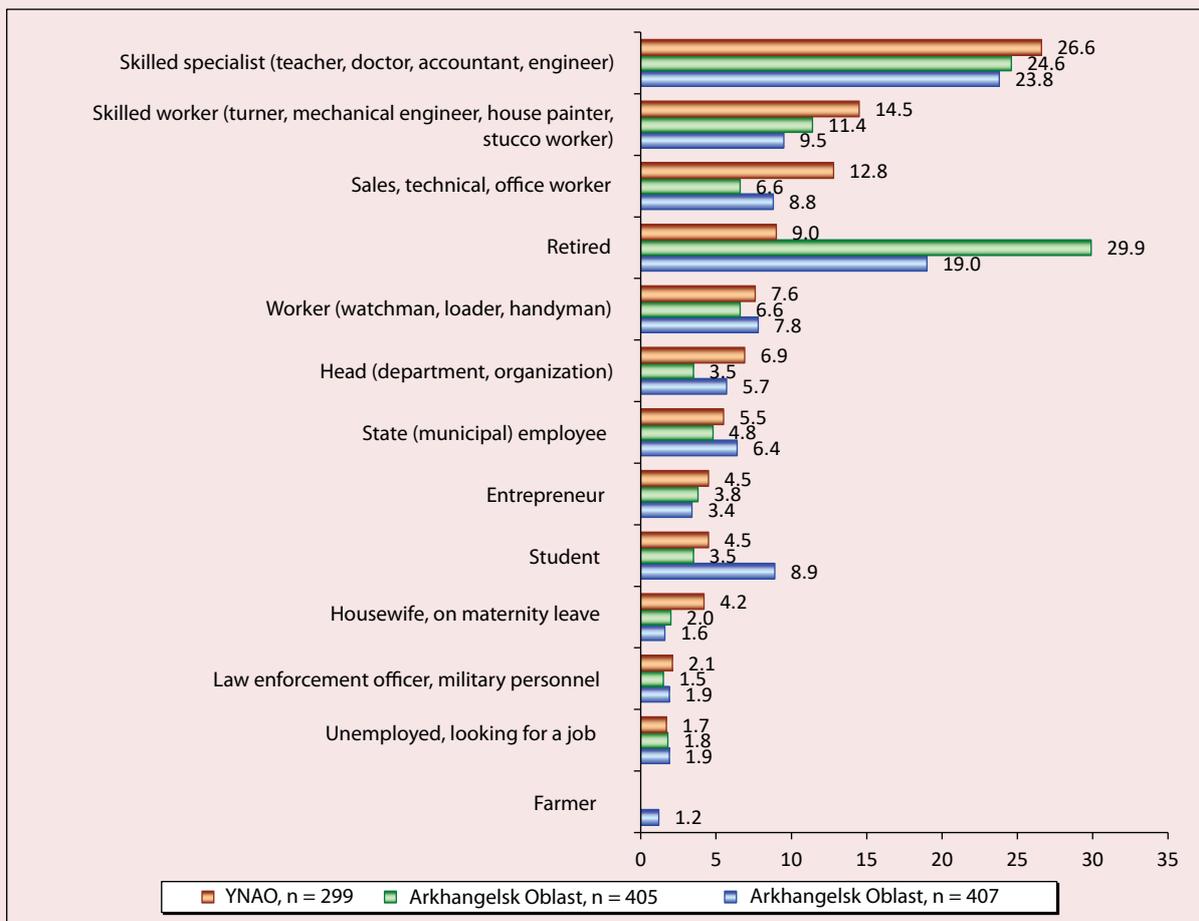


Table 3. Dynamics of average per capita GRP and income in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug

Per capita GRP, thousand rubles*					
Region	2014	2015	2016	2017	2018
Arkhangelsk Oblast (without NAO)	310.8	352.8	377.9	418.4	464.9**
Yamalo-Nenets Autonomous Okrug	3025.7	3336.5	3785.5	4581.2	5710.1***
Russia as a whole	405.2	449.1	472.1	510.3	no data
Average per capita monetary income, rubles****					
Arkhangelsk Oblast (without NAO)	28033	31114	31043	31705	31888
Yamalo-Nenets Autonomous Okrug	61252	66795	67521	71705	74304
Russia as a whole	27766	30467	30744	31367	32609

Sources: * Official website of the Federal State Statistics Service. National accounts. Gross regional product. Available at: http://old.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/accounts/#
 ** Official website of the Office of the Federal State Statistics Service for the Arkhangelsk Oblast and Nenets Autonomous Okrug. Available at: <https://arhangelskstat.gks.ru/grp11001>
 *** Yamalo-Nenets Autonomous Okrug in numbers (20152019): Concise statistics collection. Tyumen, 2020. 193 p. P. 8. Available at: https://tumstat.gks.ru/storage/mediabank/25159_2020.pdf
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Figure 2. Distribution of respondents by socio-professional status, % for each set of respondents



which can be explained by the spread of pensioner work in the Okrug, the widespread use of rotation system in hiring workers at large oil and gas producing enterprises located in the region, as well as the practice of pensioners moving to regions with a more favorable climate. In the remaining cohorts, the ratio of shares for similar socio-professional groups in different samples does not differ significantly. In addition, the incomparably smaller number of the disabled population in Yamalo-Nenets Autonomous Okrug, other things being equal, indirectly indicates the availability of a larger amount of the total human capital in the Okrug.

We point out that the official unemployment rates for the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug are several times higher (Tab. 4), than the share of the unemployed in our

samples. The difference is partly explained by the fact that people in this category, as a rule, are least likely to take part in opinion polls or indicate their status.

Thus, the design of our study unites theoretical approaches that include sensitive categories characterizing human capital (education, health, socio-professional status), which are quite easily quantifiable, with quantitative representations of categories characterizing value orientations and attitudes that are difficult to quantify and that require special valid scales and tools, among other things, in expressions and explanations of connections (relationships).

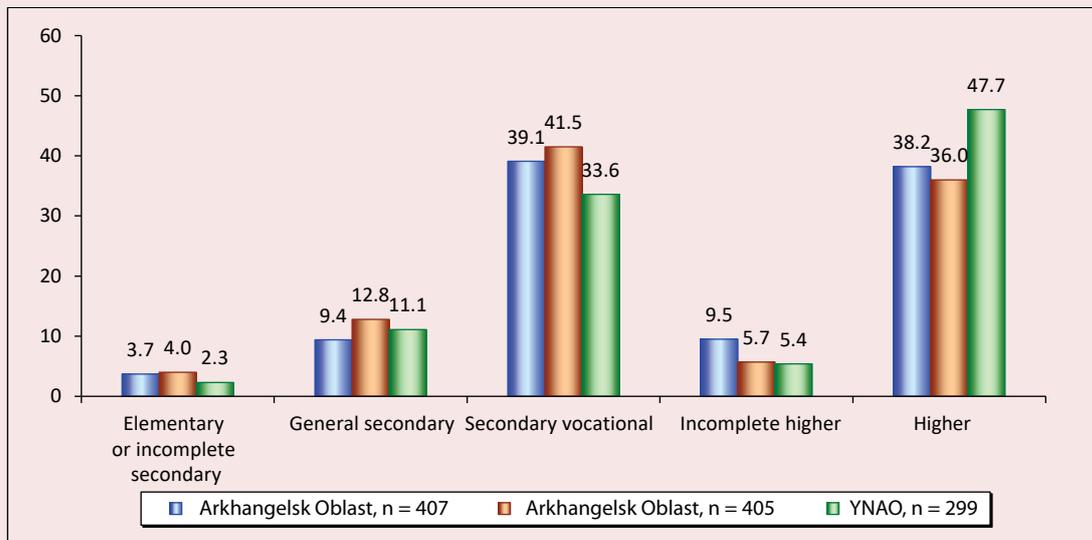
First-order results. Education, health, socio-professional status: How they are related in the sociological assessment of human capital in the Arctic regions

Table 4. Unemployment rate dynamics in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug, %

Region	2014	2015	2016	2017	2018
Arkhangelsk Oblast (without NAO)	7.3	6.8	7.1	6.4	6.3
Yamalo-Nenets Autonomous Okrug	3.1	3.6	2.6	3.2	2.1
Russia as a whole	5.2	5.6	5.5	5.2	4.8

Source: Official website of the Federal State Statistics Service. Labor market, employment and wages. Human resources. Unemployment rate broken down by constituent entity of the Russian Federation. Available at: http://www.gks.ru/free_doc/new_site/population/trud/tab_trud6.htm

Figure 3. Distribution of respondents by level of education, % for each set of respondents



Presenting an analytical review of statistically significant relationships based on the data obtained in our surveys, first of all, we shall briefly focus on the features of the distribution of educational statuses of respondents in the two Arctic regions. The frequency distribution for each of the samples is shown in *Figure 3*.

Among the respondents in both regions, there are more persons with secondary or higher professional education; this is mostly consistent with statistical data and fundamentally confirms the thesis about the high level of human capital in Russia as a whole and in the industrialized regions of the Russian Federation in particular. At the same time, the share of people with higher education in Yamalo-Nenets Autonomous Okrug is much higher than in the Arkhangelsk Oblast, despite the more developed educational infrastructure of the latter. Obviously, this also indicates the results

of cooperation between the authorities and the enterprises of the oil and gas industry, aimed at effective reproduction of high-quality human capital in the Okrug.

At the same time, education, although it is an important component of human capital, implies the presence of interrelations with its other components, which makes it necessary to identify and, if possible, measure them. Identification and measurement of statistically significant relationships (dependencies) between variables should reflect the results of investments in educational capital, health capital, as well as relevant indicators of return on human capital (income level measured through self-assessment of financial status and socio-professional status). Our data characterize these dependencies very ambiguously. *Table 5* shows that although there is a statistically significant relationship ($p < 0.01$) between self-assessments of financial situation and

Table 5. Relationship of self-assessment of financial situation with the level of education of respondents, Arkhangelsk Oblast, n = 407*

		Self-assessment of financial situation			Total	
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items		
Education level	General secondary	Frequency	6	17	12	35
		%	17.1	48.6	34.3	100.0
	Secondary vocational	Frequency	32	77	46	155
		%	20.6	49.7	29.7	100.0
	Incomplete higher	Frequency	4	15	16	35
		%	11.4	42.9	45.7	100.0
	Higher	Frequency	5	69	68	142
		%	3.5	48.6	47.9	100.0
Total		Frequency	47	178	142	367
		%	12.8	48.5	38.7	100.0

*Hereinafter, we compiled the tables on the basis of statistical analysis of the survey materials. In Tables 5–6, groups of respondents with the most rarely occurring, extreme values of the conjugated variables are excluded from the analysis in order to increase the reliability of the chi-squared test, which reveals the presence/absence of a significant relationship between two variables. For the variable “self-assessment of financial situation”, these values characterize the least and most affluent, for the variable “education level” – persons with incomplete secondary education.

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	24.817	6	0.000
Phi	0.260		0.000
Cramér's V	0.184		0.000

the level of education of residents of the Arctic territories of the Arkhangelsk Oblast ($n = 407$), it is very weak (Cramér's $V < 0.2$): respondents with higher education assess their financial situation as being good, among them there is a greater proportion of people with incomes above average. However, regardless of the level of education, almost half of all respondents have average income.

Table 6 shows that in another sample of respondents ($n = 405$) from the Arkhangelsk Oblast there is a weak connection ($p > 0.05$). At the same time, such a connection was found for Yamalo-Nenets Autonomous Okrug (Cramér's $V \approx 0.2$): respondents with higher education were twice as likely to note that their income is above average,

compared with respondents with general secondary education alone. In this case, it is quite possible to assume that if vocational education helps receive higher income, then it happens in the presence of additional factors that are associated with the structural features of the labor market, in particular, greater or lesser demand for skilled labor. It is obvious that the "overproduction" of specialists with higher education also has its implications in the Russian context. At the same time, in the modern situation, when education investments, both public and personal, do not endow individuals with special competitive advantages in the labor market and do not help them receive high incomes, the continuing significant demand for higher education services

Table 6. Relationship between self-assessment of financial situation and the level of education in respondents, %
Arkhangelsk Oblast, $n = 405$; Yamalo-Nenets Autonomous Okrug, $n = 299$

		Self-assessment of financial situation			
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items	
Arkhangelsk Oblast	Education level	General secondary	19.6	45.7	34.8
		Secondary vocational	20.5	39.1	40.4
		Incomplete higher	21.7	30.4	47.8
		Высшее	12.3	44.9	42.8
	Total	17.4	41.6	41.0	
Yamalo-Nenets AO	Education level	General secondary	7.1	64.3	28.6
		Secondary vocational	11.2	48.0	40.8
		Incomplete higher	0.0	37.5	62.5
		Higher	7.5	28.6	63.9
	Total	8.4	39.6	52.0	

Arkhangelsk Oblast	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	5.581	6	0.472
Phi	0.124		0.472
Cramér's V	0.088		0.472
Yamalo-Nenets AO	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	21.872	6	0.001
Phi	0.282		0.001
Cramér's V	0.199		0.001

Table 7. Relationship between self-assessments of the financial situation and physical health of respondents, Arkhangelsk Oblast, n = 407*

		Self-assessment of financial situation			Total	
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items		
Self-assessment of physical health	Good	Frequency	15	50	62	127
		%	11.8	39.4	48.8	100.0
	Sooner good	Frequency	11	104	59	174
		%	6.3	59.8	33.9	100.0
	Sooner poor	Frequency	12	23	14	49
		%	24.5	46.9	28.6	100.0
	Poor	Frequency	4	2	5	11
		%	36.4	18.2	45.5	100.0
Total		Frequency	42	179	140	361
		%	11.6	49.6	38.8	100.0

* In Tables 7–10, when calculating the chi-square, for its greater reliability, groups of respondents with the most rarely occurring, extreme values of conjugated variables were excluded from the analysis. For the variable “self-assessment of financial situation”, these values characterize the least and most affluent, for the variable “self-assessment of mental health” – people who have an extremely low estimate of their emotional and/or mental state.

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	31.345	6	0.000
Phi	0.295		0.000
Cramér's V	0.208		0.000

Table 8. Relationship between self-assessments of the financial situation and mental health of respondents, Arkhangelsk Oblast, n = 407

		Self-assessment of financial situation			Total	
		We have enough money to buy food, but it's a problem to buy clothes	We have enough to buy food and clothing, but buying durable items is a problem	We can easily purchase durable items		
Self-assessment of mental health	Good	Frequency	16	75	72	163
		%	9.8	46.0	44.2	100.0
	Sooner good	Frequency	23	95	53	171
		%	13.5	55.6	31.0	100.0
	Sooner poor	Frequency	5	11	12	28
		%	17.9	39.3	42.9	100.0
Total		Frequency	44	181	137	362
		%	12.2	50.0	37.8	100.0

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	7.966	4	0.093
Phi	0.148		0.093
Cramér's V	0.105		0.093

shows, rather, the attitude of Russians toward it – from a utilitarian means to ensure material and financial well-being in the future, it has turned into an independent cultural value, an obligatory component of average cultural capital (in the sense in which P. Bourdieu interpreted it).

Tables 7, 8 show the values of the variables of physical and mental health, on the one hand, and self-assessment of the financial situation, on the other³. Here it is obvious that there is a statistically significant relationship between respondents' assessment of their physical health and the assessment of their financial situation: among people with good health, the proportion of people with medium and high incomes is higher; while among people with low incomes, the proportion of those who have poor health is higher. It is a direct illustration of the fact that "it is better to be rich and healthy than to be poor and sick". But at the same time, it would be an unjustly narrow viewpoint to see only a direct dependence of material well-being on physical health, since poor health can be not only a cause (diseases lead to a decrease in working capacity and, thus, a decrease in income), but also

a consequence of a low standard of living (poverty contributes to the deterioration of health due to poor nutrition, poor living conditions, unavailability of medical services and wellness procedures). As for the mental health of residents of the Arctic territories of the Arkhangelsk Oblast, according to the data provided, it is statistically associated with the self-assessment of their financial situation very weakly ($p > 0.05$). The explanation for this can be twofold: either the respondents underestimate the importance of their mental health, or the "harsh northern character" organically implies mental stability, etc.

The most significant, as expected, were the interrelations of socio-professional status and the level of education (*Tab. 9, 10*). The data on all three samples indicate that belonging to certain socio-professional groups that differ not only in the content of work and qualification requirements, but also in status, is largely determined by formal, including specialized, education. Among respondents with secondary education, representatives of groups with a relatively low status in the system of socio-professional stratification

Table 9. Relationship between the level of education of the respondents and their belonging to a socio-professional group, Arkhangelsk Oblast, n = 407, % by column

What socio-professional group do you identify with?	Education level			Total
	General secondary	Secondary vocational	Higher	
Unskilled worker	41.4	11.4	0.0	9.3
Skilled worker	17.2	20.7	2.3	12.3
State (municipal) employee	10.3	6.4	9.9	8.3
Sales, technical, office worker	10.3	15.0	4.6	10.0
Qualified specialist	0.0	16.4	54.2	31.3
Head (departments, organizations)	6.9	0.0	14.5	7.0
Retired	13.8	30.0	14.5	21.7

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	142.174	12	0.000
Phi	0.688		0.000
Cramér's V	0.487		0.000

³ Since no questions about physical and mental health were asked during the survey within the framework of the project "Value-based and cognitive drivers of entrepreneurial behavior of the population of the Arctic territories of Russia", the text contains the results of the analysis concerning only the Arctic territories of the Arkhangelsk Oblast (n = 407).

Table 10. Relationship between the respondents' level of education and their belonging to a socio-professional group, Arkhangelsk Oblast, n = 405; Yamalo-Nenets Autonomous Okrug, n = 299, % by column

What socio-professional group do you identify with?	Education level							
	Arkhangelsk Oblast				Yamalo-Nenets AO			
	General secondary	Secondary vocational	Higher	Total	General secondary	Secondary vocational	Higher	Total
Unskilled worker	20.5	7.6	0.8	6.4	26.9	12.0	2.6	8.9
Skilled worker	12.8	18.8	2.3	11.1	15.4	31.3	5.2	16.0
State (municipal) employee	5.1	2.8	9.2	5.7	7.7	4.8	7.8	6.7
Sales, technical, office worker	10.3	9.7	3.1	7.0	11.5	19.3	13.8	15.6
Qualified specialist	7.7	18.8	48.1	29.6	15.4	14.5	50.9	33.3
Head (departments, organizations)	2.6	1.4	8.4	4.5	0.0	3.6	13.8	8.4
Retired	41.0	41.0	28.2	35.7	23.1	14.5	6.0	11.1

Arkhangelsk Oblast	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	84.346	12	0.000
Phi	0.518		0.000
Cramér's V	0.366		0.000
Yamalo-Nenets AO	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	75.605	12	0.000
Phi	0.580		0.000
Cramér's V	0.410		0.000

(unskilled workers, to a lesser extent – skilled workers) have the largest share. In the group of people with secondary vocational education, skilled workers predominate in all samples. There are also significant shares of low-skilled workers in the service sector and qualified specialists (doctors, engineers, teachers, etc.), who are distinguished by a higher status associated with higher qualifications and the intellectual nature of work. In the group of respondents with higher education, there is a predominance of qualified specialists (more than half of the number of respondents), as well as the largest proportion of managers who, respectively, have the highest status in the socio-professional hierarchy. Thus, it turns out that the return on investment in educational capital is much more evident in the levels of socio-professional stratification than in income levels.

Tables 11–12⁴ reflect the relationship between socio-professional status and health. There is a statistically significant relationship between physical health and belonging to a certain socio-professional group, but it manifests itself as very weak ($p > 0.05$), if we do not take into account cases when respondents chose the “poor” option.

As for mental health, we have also revealed the presence of a weak relationship between the variables under consideration. At the same time, on the one hand, among those who assessed their emotional and psychological state as good, the proportion of unskilled workers (low-status group) is quite high (above the average in the sample); on the other hand, the same situation is typical of managers (high-status group). However, the

⁴ Data only for the Arctic territories of the Arkhangelsk Oblast.

Table 11. Relationship between self-assessments of respondents' physical health and belonging to a socio-professional group, Arkhangelsk Oblast, n = 407, % by column

What socio-professional group do you identify with?	Self-assessment of physical health			Total
	Good	Sooner good	Sooner poor	
Unskilled worker	10.4	9.1	13.0	10.1
Skilled worker	17.7	11.0	4.3	12.2
State (municipal) employee	5.2	11.0	8.7	8.8
Sales, technical, office worker	12.5	11.7	10.9	11.8
Qualified specialist	27.1	31.8	26.1	29.4
Head (departments, organizations)	11.5	6.5	4.3	7.8
Retired	15.6	18.8	32.6	19.9

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	15.865	12	0.198
Phi	0.232		0.198
Cramér's V	0.164		0.198

Table 12. Relationship between self-assessments of respondents' mental health and belonging to a socio-professional group, Arkhangelsk Oblast, n = 407, % by columns

What socio-professional group do you identify with?	Self-assessment of mental health			Total
	Good	Sooner good	Sooner poor	
Unskilled worker	13,0	8,0	7,7	10,1
Skilled worker	12,2	13,3	3,8	12,1
State (municipal) employee	4,6	10,0	15,4	8,1
Sales, technical, office worker	10,7	11,3	11,5	11,1
Qualified specialist	33,6	27,3	23,1	29,6
Head (departments, organizations)	12,2	2,7	3,8	6,8
Retired	13,7	27,3	34,6	22,1

	Value	Degrees of freedom	Asymptotic significance
Pearson's chi-squared test	26,774	12	0,008
Phi	0,295		0,008
Cramér's V	0,209		0,008

share of another high-status socio-professional group – state and municipal employees – in the total array increases as the self-esteem of mental health decreases. With such a nonlinear relationship of variables, we can assume that one of the factors influencing the assessment of mental health is risk-taking, the presence of stress at work, etc.

It follows from the above data that the statistically significant dependence of at least one of the parameters for assessing the return on investment on human capital is caused only by the level of education, and this is most evident in the influence on belonging to socio-professional groups with a certain rank of status: the higher

the level of education, the more the proportion of representatives of high-status socio-professional groups increases.

Second-order results. Value orientations in the socio-cultural foundations of the reproduction of human capital in the Arctic regions

A number of the concepts mentioned above contain statements about the influence of attitudes and value orientations on the basic patterns of economic behavior. The main postulate in this regard is the thesis that value orientations and personal qualities formed under their influence contribute to the formation of such behaviors that allow achieving the desired level of material well-being and the corresponding status in the system of socio-professional stratification.

The analysis of the empirical material we have obtained basically confirms the hypothesis that value orientations can be drivers of the reproduction of human capital (efforts to improve the educational level and maintain health) and conditions for its rational and effective use (conversion of human capital into income and status). However,

such influence is not direct or strictly defined. Rather, sociocultural factors in general and value orientations in particular are ambivalent in relation to human capital.

In order to identify the role of value orientations in the formation and reproduction of human capital, we used the approach of M. Rokeach, which involves the allocation of values of two classes: terminal, reflecting the target attitudes of individuals (what they want to achieve), and instrumental, through which the idea of the approved means of achieving goals is expressed. This approach was adapted to the Russian context by A. Goshtaus, A. Semenov, V. Yadov, and then N.I. Lapin et al. [37; 44, pp. 262–264].

The use of this approach in surveys of residents of the Arctic territories of the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug produced the following distributions (*Tab. 13, 14*). The data show that the dominant sets of terminal values (in their upper positions) in the two regions are almost identical, and the differences in averages are statistically insignificant (see *Tab. 13*).

Table 13. Average values of respondents' adherence to terminal values, points on a five-point scale

Terminal value	Arkhangelsk Oblast (n = 405)	Yamalo-Nenets AO (n = 299)
Creativity, hobbies	4.28	4.36
Family and children	4.87	4.94
Love, relationships	4.63	4.66
Health	4.85	4.91
Harmony with the surrounding world	4.52	4.62
Public recognition	3.77	3.81
Financial security	4.44	4.51
Personal safety and the safety of loved ones	4.85	4.93
Active life	4.33	4.45
Pleasure, entertainment	3.77	3.79
Life wisdom	4.59	4.64
Peaceful life	4.78	4.88
Order and stability	4.72	4.82
Improving education and general culture	4.53	4.76
Freedom, independence	4.60	4.68
Equality and justice	4.62	4.67
Beauty of nature and works of art	4.60	4.58
Interesting job	4.57	4.77

Table 14. Average values of respondents' adherence to instrumental values, points on a five-point scale

Instrumental value	Arkhangelsk Oblast (n = 405)	Yamalo-Nenets AO (n = 299)
Good manners, politeness	4.81	4.86
Neatness	4.64	4.72
Cheerfulness	4.59	4.59
Demanding of oneself and others	4.47	4.44
Ambition, the desire to succeed	4.12	4.21
Diligence, conscientious attitude toward duties	4.82	4.87
Independence, independence	4.53	4.64
Education, extensive knowledge	4.61	4.74
Responsibility	4.87	4.93
Prudence, sanity	4.75	4.84
Restraint, self-control	4.70	4.77
Courage, determination	4.53	4.60
Perseverance, firmness of character	4.45	4.51
Tolerance of other people's views, lifestyle	4.24	4.25
Honesty	4.83	4.84
Ability to understand and respect someone else's point of view	4.70	4.71
Diligence, efficiency	4.80	4.83
Sensitivity, caring	4.70	4.77

The hierarchy of instrumental values turned out to be close to the above, with relatively small differences (see Tab. 14). This provides a basis for analyzing samples for both regions in a single array.

The analysis of correlations between terminal and instrumental values, on the one hand, and indicators of material well-being and socio-professional status, on the other, has shown that there are few statistically significant relationships ($p \leq 0.05$) between the two groups of variables and they are all very weak (Tab. 15). It turns out that in this case, the values of both classes have practically no direct and immediate impact on the conversion of human capital into material well-being and socio-professional achievements.

The ideas about value orientations as drivers of investment in human capital – both in health and in education – look more solid. Moreover, the terminal values include health and education, and

the instrumental values include such values that seem important for successful advancement in society and at work (“diligence, conscientious attitude toward duties”, “responsibility”, “diligence/efficiency”, “ambition”).

Table 16 shows contingency coefficients for statistically significant ($p \leq 0.05$) relationships between the values allocated and the level of education (in the framework of the survey, on the basis of which the analysis is carried out, no questions about self-assessment of health were asked). It is quite expected that such values included “improving education and general culture”, “public recognition”, “financial security”, with a very weak relationship between independent and dependent variables (Cramér's $V < 0.2$). As in the case of the level of education, there is no significant influence of adherence to certain value orientations, although, according to the assumption, some of them should directly stimulate and motivate individuals to

Table 15. Relationship between the degree of adherence to terminal and instrumental values, self-assessment of financial situation and socio-professional status in the total number of respondents in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704*)

	Self-assessment of financial situation	Socio-professional status
Terminal value		
Financial security		$\chi^2 = 0.031$ Cramér's V = 0.152
Pleasure, entertainment		$\chi^2 = 0.004$ Cramér's V = 0.179
Personal safety and the safety of loved ones	$\chi^2 = 0.025$ Cramér's V = 0.0116	
Instrumental value		
Courage, determination	$\chi^2 = 0.025$ Cramér's V = 0.125	$\chi^2 = 0.001$ Cramér's V = 0.186
Tolerance of other people's views, lifestyle	$\chi^2 = 0.004$ Cramér's V = 0.130	
Restraint, self-control	$\chi^2 = 0.047$ Cramér's V = 0.109	
Perseverance, firmness of character	$\chi^2 = 0.000$ Cramér's V = 0.147	
Diligence, efficiency	$\chi^2 = 0.004$ Cramér's V = 0.131	
* Unified array for Yamalo-Nenets Autonomous Okrug and Arctic municipalities of the Arkhangelsk Oblast.		

Table 16. Relationship between the degree of adherence to terminal and instrumental values and the educational level of respondents in the total amount of respondents in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704)

	Education level
Terminal value	
Financial security	$\chi^2 = 0.003$ Cramér's V = 0.124
Family and children	$\chi^2 = 0.009$ Cramér's V = 0.113
Health	$\chi^2 = 0.027$ Cramér's V = 0.103
Public recognition	$\chi^2 = 0.007$ Cramér's V = 0.122
Improving education and general culture	$\chi^2 = 0.005$ Cramér's V = 0.119
Instrumental value	
Diligence, conscientious attitude toward duties	$\chi^2 = 0.000$ Cramér's V = 0.137

receive professional education, including higher education. The explanation for such an unexpected “smoothing” may be initially very high average indicators of all values for which a sufficiently strong relationship with the level of education has been confirmed (except for “public recognition”).

It has been of interest to consider the connection of terminal and instrumental values with the propensity (positive attitude as a source of motivation) to entrepreneurial activity. To identify this propensity and the corresponding grouping of respondents, we used answers to the question “Have you ever thought about starting your own business?”: 1) those who have opened their own business (“entrepreneurs”), 2) those who are thinking about opening their own business (“potential entrepreneurs”), 3) those who have not thought about it (“non-entrepreneurs”).

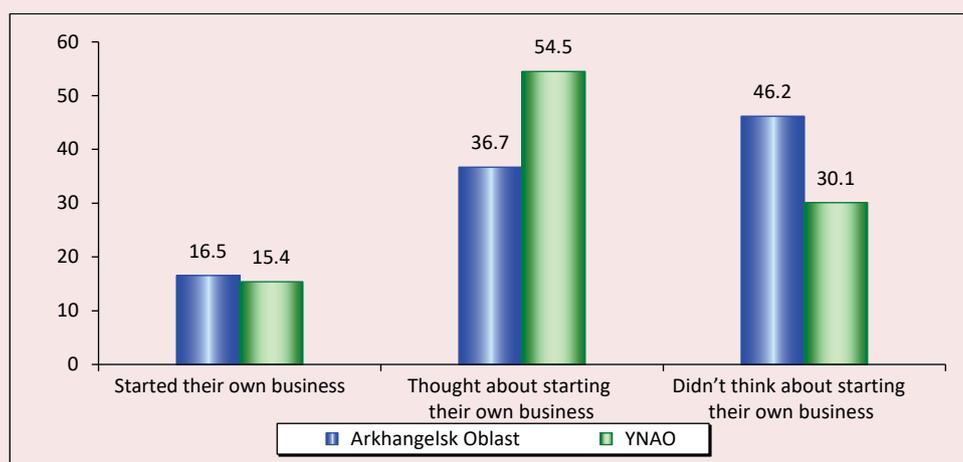
The specifics of the system of value orientations were determined for each group. At the same time, the differences between the groups were identified on the basis of the empirical data obtained and did

not involve a comparison of the value system of the first group of respondents (entrepreneurs) with some value profiles (models) of a “typical entrepreneur” claiming to be universal, which are presented in literature [45, pp. 8–10].

The distribution of respondents in three constructed groups (*Fig. 4*) shows a greater potential for entrepreneurship in Yamalo-Nenets Autonomous Okrug; however, the proportion of those who identified themselves as active entrepreneurs (taking into account sampling error) in both regions is approximately the same.

If we take into account (as shown above, see Tab. 13, 14) that there are no significant differences in the hierarchies of values among residents of the two regions, then the differences in the propensity for entrepreneurship (potential) are due to some special circumstances, for example, a more favorable investment climate, institutional and infrastructural positions for small and medium-sized businesses in Yamalo-Nenets Autonomous Okrug compared to the Arkhangelsk Oblast⁵.

Figure 4. Distribution of respondents into groups with different propensity for entrepreneurship in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704), % of the total number of respondents



⁵ Seventh annual rating of investment attractiveness of Russian regions for 2019. *National Rating Agency*. Available at: http://www.ra-national.ru/sites/default/files/Obzor_Rating_Investment_Regions_VII_2020.pdf

Table 17. Indices of attitude toward terminal and instrumental values among respondents in the Arkhangelsk Oblast and Yamalo-Nenets Autonomous Okrug (n = 704) according to the results of the discriminant analysis

Value	Wilks' λ^*	F**
Arkhangelsk Oblast		
Career success	0.97	5.41
Improving education and general culture	0.98	4.06
Ambition, the desire to succeed	0.97	6.71
Yamalo-Nenets Autonomous Okrug		
Career success	0.98	3.48
Beauty of nature and works of art	0.98	3.02
Interesting job	0.99	3.11
Ambition, the desire to succeed	0.96	6.00
*Indicator of the ratio of the measure of intra-group variability to the measure of overall variability.		
**Indicator of the ratio of the average square between groups to the average square within the group.		

Returning to the question of differences in values between regional groups of respondents (including the latent influence of those inclined to entrepreneurship in both samples), we should note that the targeted discriminant analysis we conducted on this occasion has shown their very significant convergence (*Tab. 17*; only those terminal and instrumental values whose differences are statistically significant are presented, $p \leq 0.05$).

Despite the fact that the groups of respondents differ from each other in the degree of commitment to these values (earlier we noted that commitment to these values increases along with the propensity for entrepreneurship), the target indicator of Wilks' lambda is close to 1, which means a very weak degree of discrimination on the selected variables. Thus, although there is a difference in values between entrepreneurs and people who are not inclined to such activities, this difference is not decisive in choosing the form of economic activity. Obviously, certain conditions that favor or hinder a particular choice can play a much more significant role.

Discussion of the results

The analysis of empirical material obtained in the course of mass sample surveys allows us to point out the ambivalent nature of the manifestation of

socio-cultural factors in relation to the human capital of the Northerners. These factors can act both as foundations and as components of this form of capital. The connection between education and socio-professional status is most pronounced. It is very linear, since it is the increase in the level of education that is a direct factor contributing to the improvement of the socio-professional status, and not vice versa. The influence of the educational level on socio-professional advancement in the Arctic regions is enhanced, first of all, due to the neo-industrial vector of development (especially in Yamalo-Nenets Autonomous Okrug) in extreme natural and climatic conditions that require special qualities of human capital in general, good health and vocational education in particular. In addition, education is directly related to cultural capital, is part of the socio-cultural potential of the worker, and represents the basic universals for continuing education, including advanced training and retraining.

At the same time, the hypothesis about the relationship between the results of investments in human capital (indicators were the educational level and self-assessment of health) and the level of financial well-being (indicator: self-assessment of household income) was confirmed only partially.

A stable connection between financial well-being and physical health has been revealed, but the strength of the connection is low, and its nature is very ambiguous: higher incomes can be obtained as a result of higher productivity, which is promoted by good health, but there is another, opposite option – low incomes can lead to health deterioration. In Arctic conditions, the first trend prevails, although a certain part of the population (up to 20–25%) is openly or latently in the second one. The second trend is less typical of Yamalo-Nenets Autonomous Okrug, non-indigenous residents of such low-status categories are being “gently” pushed out of the region.

We have obtained a solution to one the main questions in our study – regarding the influence of value orientations on economic behavior patterns: a statistically significant relationship was found between individual value orientations (both terminal and instrumental) and variables reflecting the income, status and education of respondents, but it would still be an unjustified reduction to assert that it is the very values that have a direct impact on all other parts (components) of human capital and its conversion into material and status-related positions of an individual. Research indicates that the impact of socio-cultural factors is fundamental and profound. In the conditions of the Arctic regions, factors related to the spatial mainstream, market conditions, institutional formats, northern infrastructure and other parameters of the political and economic system are of particular importance in these

processes (starting with natural and climatic and ending with socio-psychological ones) in relation to individuals, their groups and the cultural environment in which they were socialized.

Also, the question of the ratio of individual, corporate and public investments in human capital and its individual parts remains very important. In Russian conditions, with the highest degree of social inequality, very few strata have the possibility of sufficient individual investments in human capital. In our study, they are represented by wealthy entrepreneurs, highly qualified specialists and managers, characterized by the greatest human capital in all respects. The group of state (municipal) employees increases their high-quality human capital mainly at the state expense. All other groups have very modest opportunities to receive “start-up” capital in general and vocational schools, a minimum of medical services and some social benefits for certain categories of the poor in budgetary public services. All further growth is provided at best by corporations; in the Arctic and other raw materials-based regions this is the most promising option. Many other organizations do not have such capabilities. Thus, the majority of low-income workers have to deal with a vicious circle of simple reproduction and use of their human capital, which is often reduced to the price (cost) of workforce. It is necessary to break this vicious circle through multi-channel financing, stimulation and motivation for the growth of human capital and its effective use in the digital economy: high-tech industries and services.

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Forming the Practices of Citizens' Participation in the Development of the Urban Environment: Habitualization or Institutionalization From Above*



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Abstract. The article presents findings of a sociological research on the process of formation of social practices of citizens' participation in the development of the urban environment. Creating a new, people-friendly urban space involves taking into account the interests of various population groups and working out the mechanisms for citizens' involvement in urban management. The purpose of the work is to identify main ways for engaging citizens in the development of the urban environment by analyzing the processes of institutionalization. The theoretical and methodological basis of the research includes works devoted to social institutions and institutionalization, social movements as institutionalization agents, the right of citizens to participate in urban development, and the issues of civic participation in designing urban spaces. The analysis has identified main participants (actors) whose interests are affected when the issue concerning the development of the urban environment is formulated and addressed. We consider two processes of formation of the rules according to which the actors perform their functions in public arenas: from below through habitualization or from above as an import of social institutions. We show the differences in the process and results of institutionalization of civic engagement in the presence or absence of a conflict of interests among the main actors: society, government, business community. We compare the processes according to the following parameters: the nature of institutional

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changes, relations and actions, type of institutional changes, structure of political opportunities, and civic engagement levels. We draw conclusions about how the orientation of the processes affects the nature of civic participation. In particular, the loss of the “partnership” and “delegation of authority” stages in the process of institutionalization from above indicates a formal and imitative nature of the practices of civic participation in urban development. The novelty of the work consists in comparing the oppositely directed processes of institutionalization of civic participation (from below and from above) on the example of a specific sphere such as urban development.

Key words: social institution, social practices, habitualization, institutionalization, civic participation.

Introduction

Modern urbanism notes the change of paradigm in city development: instead of “a city as an office” model comes “a city for life” model and social meaning is put in public space design¹. Creating an urban space, that is new and comfortable for people, involves considering the interests of different population groups and the presence of a social request for a different quality of environment. In 2020, 75% of Russians lived in cities², and it is their interests that meet the main provisions of the national project “Housing and Urban Environment”, which directly links the urban improvement with the creation of a mechanism for direct public participation in its formation. According to the instruction of the President of Russia V.V. Putin, the proportion of this category of citizens should increase to 30% by 2024³.

The development of the urban environment from the point of view of the residents and the civic initiatives they put forward is connected, first of all, with its quality. In the academic community there is no unambiguous interpretation of the concept of “quality of urban environment”, it is often substituted by the concept of “comfortable urban

environment”⁴. In order to live more comfortably, citizens contribute to the development of the city. However, the quality of the urban environment, its perception by the inhabitants determines their behavior: either prosocial (care of the environment, its restoration) or antisocial (vandalism) [1, p. 260].

Comfort of living, use and appropriation of urban areas, accessibility of public spaces are the components of the “right to the city” [2]. In modern conditions, the implementation of the “right to the city” occurs against the background of the increasing role of non-institutional forms of citizen participation [3]. Activation of social interactions at the local level is provided by the fact that the problems affect both individual residents and the local community as a whole [4, p. 23].

The number of academic studies of collective action and social movements from the perspective of neo-institutional theory is increasing [5; 6], comparisons of institutional and extra-institutional actors of urban change are carried out [7], but studies concerning formation mechanisms of public associations in Russia are still fragmentary [8, p. 113–114].

The purpose of the work is to identify the main ways of forming practices of citizen participation in urban improvement with an emphasis on the study of their institutionalization processes.

¹ See, for example: Residents of comfortable cities tend to be sedentary. Available at: <https://iq.hse.ru/news/177666082.html>

² The proportion of the urban population of the Russian Federation in the total population. *Rosstat*. Available at: <https://rosstat.gov.ru/>

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⁴ Aleshina E.P. Analysis of the use of urbanized area of Ryazan in order to optimize the characteristics of the comfort of the environment: Candidate of Sciences (Geography) dissertation. Ryazan, 1999. 155 p.

Theoretical approaches to the study of social practices and social institutions

Social practices and social institutions

In sociology, the category “social practice” is represented in the works of P. Bourdieu, P. Berger and T. Lukman, A. Giddens, G. Garfinkel, A. Schütz, etc. P. Bourdieu defined social practices as actions of social subjects⁵, which correspond to their established attitudes. Two types of practices are distinguished: everyday habitual actions and purposeful actions to transform social reality. The individual determines the appropriateness of actions based on habitus – a system of dispositions, structured “principles that give rise to practices and perceptions...” [9, p. 102]. According to A. Giddens, social practices are reproduced by actors on a regular basis, so he introduces the concept of “routinization” as the performance of actions in a habitual way. Social practice is not created every time by social actors, but is only reproduced by them [10, p. 185].

Individual actions are transformed into social practices in the process of ordering and repetition, which is called “routinization” [10] or “habitualization” [11]. Social action through the stage of habitualization passes to the status of social practice and further – social institution. “Institutionalized rules... make the relationship between actor and action more socially tautological than causal” [12, p. 18]. Institutions, actors and scripted actions “form an inseparable triad”; their co-constitution, however, “neither eradicates individuality nor weakens the actor” [13, p. 900]: the habitualization of action does not mean its thoughtless automatism.

In Russian sociology, the scientific discourse revolves around the relationship between the concepts of “social practices” and “social institutions”. Some scholars believe that social

⁵ Along with the concept of “social subject”, the concepts of “agent” (M. de Certeau) and “actor” (M. Crozier, E. Friedberg, P. Bourdieu) are used in the consideration of social practices and social institutions (author’s note).

institution is a stable form of practice, for the most part identifying practice with private institutions [14, p. 95]. The opposite view is that social practices are forms of functioning of social institutions. Social institutions are assigned the status of “content”, “essence”. [15, p. 7; 16, p. 11]. S.G. Kirdina introduces the concept of “institutional forms”, which, unlike basic institutions, act as social practices [17]. In our opinion, the consideration of social institutions and practices in the philosophical tradition of the binary approach as essence and form will not allow fully identifying institutional changes in Russian society, because it is based on the principle of prevalence of essence over form. From the perspective of the system approach, “social practices – actions” and “social institutions – dispositions” are interrelated components of one system, but their connection is mediated contextually. From this perspective, we propose to consider the formation and transformation of these system elements.

Processes of formation and change of practices and institutions. Social movements as agents of institutional change

P. Berger and T. Lukman build the process of formation of practices in four stages: habitualization, typification (identification of typical interaction ways of agents), institutionalization (identification of the role matrix – institution) and legitimization of ideas and social actions [11, p. 98]. Due to reciprocal typifications, “unique activities” of the individual become “socially meaningful, scripted actions” [13, p. 900]. Legitimization processes play a central role in the reproduction and change of social orders. According to the theory of social constructivism, new ideas and rules must be accessible and reflect public opinion, which is possible with certain efforts by groups of people to construct frames of understanding the world and themselves that they share, which legitimize and motivate collective action [18, p. 6].

The following mechanisms may be involved in changing social practices:

- emphasis on certain social actions with their subsequent representation as social norms;
- transition of practices from marginal to normative;
- borrowing of social practices [19, pp. 17–18].

Institutionalization is the process of establishing new rules or confirming existing ones [20]. Modern approaches to institutionalization take it beyond the usual actions. The essence of the process is “the permeating of social movement activity into institutional spaces” [21, p. 275], “establishment of organizational habitats of activists within institutional spaces” [22, p. 197]. Features of its course inherent in the structure of political opportunities – a set of factors on which depends the probability of collective action and the ability to achieve the set political goals [23, p. 11]. The structure has an open or closed nature, which is due to the readiness of the political system to interact with different groups of the population. It is often enough expressed that institutions are the result of struggle, and social relations of actors are asymmetrical [24; 25; 26].

Agents of institutional change are social movements [27], which correlate with institutionalized practices in a certain institutional environment [5]. From the opposite point of view, social movements develop within informal, non-institutionalized systems [28, p. 11; 29, p. 166].

The order of institutionalization

N.A. Skobelina defines the direction of this process from above as a feature inherent in the process of institutionalization of social movements in Russia [5, p. 126]. The classical way consists in the creation of movements from below: movements are formed and grow out of a group of like-minded people united by the search of a solution to a specific problem.

An important step in both processes is the recognition of legitimacy in the system of state power, legitimation in the public consciousness.

The process of institutionalization from below passes through the stages from the emergence of social need to the recognition of legitimacy in the system of state power, legitimacy in the public consciousness. At the initial stage there are no rigidly assigned social roles and statuses for individual participants. Institutionalization from above begins with the formation of goals on the part of the authorities, the creation of an order of action and the organizational core of the public association. Formalized rules and stable status-role positions, the presence of plans for the long term are the markers of the stage of institutionalization [5].

Notably, W. Gamson [30] singles out the transformation of civic activists into legitimate participants in public discussion and representatives of the interests of a particular social group as a significant result along with the achievement of publicly stated goals. He is supported in this by researchers who propose to focus precisely on the transformation of activists' positions in horizontal and vertical networks [31, p. 133].

Practices of civic participation in urban development

Nowadays in Russia, there is a demand from both society and the state for civic participation in the development of the urban environment, so the formation of appropriate practices is initiated by various groups of players: civic activists, public associations, representatives of the authorities, the business community. The strategies of the players operating in the institutional field are conditioned by power positions and asymmetries of relations [26, p. 186; 32]. Countries with a prevalence of state values over civil society values are characterized by more confrontational strategies [33, p. 50]: social movements challenging the existing power relations engage in confrontation, and the power, which the social protest is aimed at, in its turn, develops a set of formal and informal rules of the game [34].

S. Arnstein showed the difference between the “empty ritual of formal participation” and the real

citizens' participation in the management of the city on the example of the "ladder of civic participation" [35]. The steps of the "ladder", corresponding to the degree of citizens' authority, are grouped by levels from non-participation through imitation of activities (symbolic measures) to civil management. The latter includes the stages of partnership, delegation of powers and civil control.

Studies of civic participation in Russia show that local communities become active when the right to appropriate urban space is threatened. The rallying to defend interests takes place in "small" public spaces at the level of a house, a group of houses, a block, and much more rarely at the level of a city. "The developed practice of interaction, especially if it proves to be effective, contributes to the further development of the local community" [4, p. 30]. The opposite is also true: the consolidation of residents leads to the closure or revision of unwanted projects. Thus, E. Tykanova and A. Khokhlova give an example when the gradual institutionalization of the initiative group became an important driver of success in solving the urban planning conflict [26, p. 187].

Methodology

In order to achieve the goal of the research based on the review of the theories we formulated the research questions:

- who are the main participants (players), whose interests are affected in the construction and solution of the social problem – the development of the urban environment;
- what are the rules according to which the players act in the public arena forming social practices;
- how these rules are constructed: from below through assimilation or from above as an import of social institutions;
- how does the focus of "bottom vs. top" processes affect the nature of civic participation?

A multiple case study was chosen as the field research strategy. The information base included the

materials of digital networks on the topic of urban improvement, revealing the problems in this area, and media publications posted on the Internet. The base contained texts about the actions of activists from informal public associations, the activities of various project groups on urban development. The selection of cases for the study of institutionalization processes from below was made according to several criteria. The main participants, whose interests are affected when constructing and solving a social problem, in this case are citizens, who take individual actions, or informal associations of citizens, as well as institutional actors, who have resources for the development of the urban environment. Therefore, first, examples of non-associated forms of civic participation were selected, but necessarily in conjunction with information about interactions with institutional actors (government and local self-government authorities) and the population. Second, the range of problems of urban development was defined: improving the comfort of house and adjacent territory; creation or preservation of public spaces. Third, information should be presented from different perspectives: the official position of the authorities and the position of activists. For example, the search for cases of improving the comfort of the adjacent territory was carried out with an initial Google search requests on the competitions "Flowery City" ("Beautiful city", "Flowery dooryard", etc.) and the subsequent search for interviews with the winners of competitions. Materials were divided into two categories on the basis of "interaction of activists and institutional actors": without conflict and with conflict of interest. Fourth, information about individual cases is presented as much as possible for all stages of institutionalization from below [5]: emergence of need; formation of common goals; internalization of norms; spread of institutionalized forms of activity; recognition of legitimacy in the eyes of authorities, legitimacy in the mass consciousness; establishment of a system

of sanctions and rewards; creation of a system of statuses and roles.

Ten cases were selected (30 cases in total): civic participation in the development of urban environment without conflict of interest (individual and joint actions) and civic participation in the development of urban environment with conflict of interest (joint actions). As an illustration of the institutionalization process from below 11 cases were included in the article: “texts about civic participation in the development of urban environment without conflict of interest” (cases of Moscow, Blagoveshchensk, Yekaterinburg, Bogatoye settlement in Samara Oblast) and “texts about civic participation in the development of urban environment with conflict of interest” (cases of Yekaterinburg, Korolyov, Nizhny Novgorod, Vologda, Saint Petersburg). A preliminary analysis of civic participation practices showed high activity of the population of Moscow and Saint Petersburg, but the research base was deliberately expanded by searching for various practices of residents of localities from other regions. Thus, practices that took place in settlements with different populations and different administrative status came to the attention of the researcher. The full list of materials included in the article is given in the Appendix.

The array of texts was subjected to event- and discourse analysis according to the following scheme: topic is subject of discussion, theme, general meaning, main content, context, verbal reactions, comments. The main content was structured into sections corresponding to the stages of institutionalization.

Additionally, we used data from the empirical base of the research under RFBR grant no. 19-011-00724 “Barriers to civic participation and mechanisms of overcoming them at the regional level” (expert interviews). The subject matter of the interviews is quite broad and concerns various aspects of civic participation in different spheres. In this regard, as additional arguments the article

includes the data of two expert interviews, where the question was about the involvement of residents in the development of the urban environment: expert 1 – head of a public association; deputy of the City Duma, former head of the public council; expert 2 – member of the Vologda Public Council.

Institutionalization of civic participation from below

The content of the stages of institutionalization of citizen participation in the development of the urban environment on the initiative of the activists themselves is influenced by the presence or absence of the players’ conflict of interest: society, government and the business community.

Institutionalization from below without a conflict of interest is usually expressed in the improvement of the urban environment within the framework of tactical urbanism or affects “small” public spaces. After the need to improve certain small urban objects, most often “small” public spaces (entrance halls, adjacent territories, etc.) arises, activists form goals: for example, to restore an entrance hall in dilapidated housing, to improve the appearance of wooden houses, to get adjacent territory in order. In the course of performing the assigned tasks, repetitive actions become habitual. If at first *“They got the adjacent territory in order”*, then *“We saw cheap tiles, pounded in some places, at the construction site. We did the tiling – it turned out beautifully”*, *“We bought stone in the quarry – we paved a bowl for the fountain and a waterfall slide”* (Blagoveshchensk). Or: *“We managed to turn the scorched earth into a garden in three years. During this time we planted about 150 trees and shrubs, as well as perennial flowers and herbs”* (Yekaterinburg 1); *“We created the art object in the third season of the festival, and before that we spent two years restoring the old building of the post and telegraph office”* (Bogatoye settlement). In order to achieve the goal, activists develop rules of conduct and interaction with the managing companies, neighbors, representatives of the business community, at the

level of the municipality with the authorities and various institutions. For example: *“At the request of the tenants, the utilities workers stopped dumping snow mixed with chemicals on the lawns”* (Moscow 1), *“The managing company helped with the purchase of constructional materials”* (Blagoveshchensk), *“I negotiated with the organization responsible for the work and ended up sending an official letter to the Moscow Mayor. Then I got support from the local managing company”* (Moscow 2). But they do not always lead to agreements: *“There is also a financial problem: there are few entrepreneurs here, and not everyone is willing to help”* (Bogatoye settlement). The process of institutionalization goes through the habitualization of actions and is expressed in the presence of stable patterns of behavior, interactions, and informal rules.

As the results of institutionalization from below, we present the following:

– the spread of institutionalized forms of activity, for instance: *“The example of the tenants of a house in Sivtsev Vrazhek, who used their own money to uncover murals on the ceiling of their apartment building, inspired the return of the entrance hall to its historical appearance”* (Moscow 2);

– establishing a system of sanctions and rewards: *“The garden on Bibirevskaya participated in a landscaping contest and was rewarded with seedlings from Aptekarsky Ogorod”* (Moscow 1), *“In Blagoveshchensk, the results of the contest for the best yard of an apartment building were summed up. The organizers accepted more than 30 applications”* (Blagoveshchensk), *“Neighbors come and accord a thank-you”* (Moscow 1);

– creating a system of statuses and roles: *“mistress of the garden”* (Moscow 1), *“manages this lawn”* (Vologda);

– consolidation of the local community: *“Local janitor Ilhom brought oriental roses from Uzbekistan, his homeland. Sasha, a neighbor from the dacha near Moscow, brought the same grapes, plum and pear seedlings. Another neighbor brought strawberries”*

(Moscow 1); *“No one forced the neighbors. When they saw that the work was moving, gradually neighbors joined in – some to plant flowers, some to paint something. Even those who were initially against it came”* (Blagoveshchensk), *“So many people came that there weren't enough tools for everyone”* (Yekaterinburg 1). Although there is the opposite result: *“After three seasons, he still could not find like-minded people”* (Bogatoye settlement).

As a significant result, let us single out the realization of the “right to the city” in the form of the appropriation of territories, going beyond the limited space of an apartment. Value bases of civic activism are formed: *“The main idea is that this is what citizens do for citizens”* (Yekaterinburg 1), *“Festival helps, first of all, not houses, but people – to change their way of thinking, to believe that progress is possible”* (Bogatoye settlement). For the spread of informally anchored social practices, it is important not just to broadcast positive experience and motivation (*“My advice to the tenants of historic buildings is to be actively involved in the improvement of their own entryway”* (Moscow 2)), but to transfer experience: *“If any work begins, you should immediately contact “Archnadzor” or other nonprofit organizations. They will direct people to the right places and help make sure that the old tiles are not removed or the old windows are not replaced”* (Moscow 2).

Let us note the role of the socio-cultural context as an example of the differences in the support of civic initiatives by residents of cities and small towns. *“In the village there are fewer active residents than in the city. A festival for city dwellers is an opportunity to escape somewhere from their apartments, while in our settlement there are places to go: to the river, to the lake, to the garden, to the woods. This is why the festival in the village is attended only by people with ideas, and there are not many of them. In addition, the residents of settlements are disdainful of going to paint their neighbor's house”* (Bogatoye settlement).

Public discourse regarding leaders is filled with themes of responsibility and activity, exclusivity: *“One is the most active, who will take on this responsibility, make efforts and call the shots”* (Moscow 2); *“The villagers needed some kind of hero, an engine that will advance their interests”* (Bogatoye settlement).

So, during the formation process of the institution of citizen participation in the creation of a comfortable urban environment from below in the absence of a conflict of interest, the mechanism of habitualization is involved, as well as all the stages presented in the “ladder of civic participation” by S. Arnstein are implemented.

The process is somewhat different if we consider it in relation to civic associations, because in this case the emphasis is put on organizational formality, development and internalization of norms, rules of behavior, as well as recognition of the legitimacy of a civic association in the eyes of the authorities, its legitimacy in the mass consciousness. More often than not, citizens are forced to unite by a conflict of interests, so at the initial stage of the institutionalization of civic participation the emergence of the need for a social movement is related to activists defending their position and the interests of the population. For example, according to VTsIOM data,⁶ 74% of Yekaterinburg residents did not believe that the city square near the Drama Theater was an appropriate place to erect a religious building (Yekaterinburg 2). Activists form common goals most often in the format of slogans and appeals: *“You want a temple, we want a square – there will be war”* (Yekaterinburg 2), *“Let’s protect Ryabinovy Square!”* (Korolyov), *“Let’s preserve and improve the square...”* (Nizhny Novgorod). In order to expand the movement and rally residents, organizational registration is carried out on social media: the movement “The River unites”, the

Vkontakte group “Let’s save the square in Prioksky District”, etc.

In the initial stages of the movement development in a situation of conflict of interest, the structure of political opportunities is of a closed nature. The authorities demonstrate their unwillingness to interact with different groups of people: “An official from the governor’s administration arrived... The only thing to check is whether so many residents are really against the construction or whether it was just a bunch of insane citizens who made such a fuss” (Nizhny Novgorod). Until activists bring the problem to the federal level and protest actions intensify, the authorities stubbornly ignore the opinion of experts and citizens, as demonstrated by the history of protests against bank protection in Vologda and the construction of the Okhta Center in Saint Petersburg. Since in situations of conflict or asymmetry of relations the authorities develop a procedure, the response of the opposing party also becomes the development of rules of conduct: *“Yes, all conversations with the police and other defenders of construction are recorded. Video recording should be turned on before the conversation”* (Yekaterinburg 2), *“We draw only flowers on the asphalt. No political slogans! We do not make any political statements in interviews!”* (Vologda).

In order to achieve the goal, the public activists are forced to resort to the tactic of active interactions, they urge citizens: *“We need to write to Kuivashev on his Instagram account, while comments are not yet disabled there. It is also necessary to involve the maximum number of the major media, write and call all departments”* (Yekaterinburg 2), *“Let’s go out tonight for a rally! Let’s meet with representatives of the administration!”* (Korolyov), *“We can try to have phone conversations with him... In the meantime, written statements from the initiative group have been submitted today. And letters, and a flash mob, etc., everything will happen”* (Nizhny Novgorod).

⁶ City and Church: VTsIOM survey in Yekaterinburg. Available at: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/gorod-i-khram-opros-vcziom-v-ekaterinburge>

The forms of activity that have not yet been institutionalized are disseminated by informing, advising, and involving citizens through petitions and participation in rallies. Activists broadcast experience in solving problematic issues: *"On the official site of the Russian public initiative you need to be registered through the Gosusligi"* (Nizhny Novgorod), *"We planned to work out a scheme that other interested citizens can use. But so far the committee suppresses attempts to replicate our experience"* (Saint Petersburg 2).

Situations of conflict of interest unfold between activists, on the one hand, and business and government, on the other. But in this situation, the interests of activists and the entire population may not coincide. Quite often activists additionally convince the population what their interests are. Therefore, the processes of legitimization in mass consciousness are ambivalent: *"Residents and those who supported them, you did a good job"* (Korolyov) vs. *"Surprised by the complete indifference of the residents of the Vologda Oblast"* (Vologda). On the part of the population there is also the assignment of responsibility for solving the problem to the 'core' of the social movement: *"...no one is stopping us from controlling this process!"* (Yekaterinburg 2). However, in the absence of dialogue with the authorities, pessimistic sentiments arise among the population: *"We know that the comments will not be taken into account"* (Yekaterinburg 2). In the case of conflicts of interest, social roles are constructed on the part of the opponents. For example, the protest campaign against the construction of the Okhta Center in Saint Petersburg was built on the image of the "alien-invader", which contributed to the strengthening of the urban conservation movement by consolidating residents on the basis of the identity of Saint Petersburg resident. Supporters of the construction broadcast the image of the opposition as "fringe", "provocateurs" and "urban madmen" [36]. The discourse toward

leader and activist figures turns toward disparaging characterizations: *"I am your neighbor. This is the tedious man who was disturbing your rest in the evenings"* (Nizhny Novgorod); *"Activists are often thought of as urban madmen"*, *"Some idiot showed up and did this"* (Saint Petersburg 2).

Social practices that received broad public support are usually recognized by the authorities as legitimate: *"Today the reception of the initiative group at Morozov's office was held, and the minister of construction of the Nizhny Novgorod Oblast was also present"* (Nizhny Novgorod), *"... to organize a direct conversation between two sides with each other. I am ready to mediate in this conversation"* (from the mayor's blog, Yekaterinburg 2) and even *"The governor of the Moscow Oblast harshly pointed out to Aleksandr Khodyrev the mistakes made by the municipal leadership"* (Korolyov).

There is a temporary consolidation of the community: *"At various times there are from a few hundred to a thousand and a half to two thousand people at once"* (Yekaterinburg 2); *"People who live in the same neighborhood and previously, let's face it, paid little attention to each other, have now begun to recognize their neighbors in the streets, have begun to say hello. And that's great!"* (Nizhny Novgorod); *"Before, there was no forum where they could talk about it, and now there's not only a group of "Derev'ya Peterburga", but also similar communities made by residents of almost every district"* (Saint Petersburg 2).

The situations under consideration require an effort on the part of activists to maintain and expand their group, in which a new order of action is formed: *"Dealing with a team is very difficult, and I understand it's not just my problem. It is very difficult to get people to do something, because not everyone has as many resources as I do"* (Saint Petersburg 2); *"Only those who take to heart the problem of the embankment sign up for groups concerned about this topic"* (Vologda).

If we talk about such an indicator of institutionalization as the presence of long-term plans, they relate only to the problem situation around which civic activism is unfolding: *“Officials have publicly reported on their work, but this does not mean that we have to stop asking questions and trying to build a constructive dialogue with them”* (Yekaterinburg 2); *“Do not leave the group until the issue is finally resolved”* (Nizhny Novgorod).

Analysis of practice showed that few public associations reach the stage of creating a system of statuses and roles, because civil activism in Russia is situational in nature, and even to the stage of legitimation, because the population keeps out of the regular activists' actions. The dual situation is with the recognition of associations by the authorities – from cooperation in cases of large-scale support to substitution of the partnership between the authorities and citizens with “imitation of a dialogue”. *Expert 1: “The purpose of the workshops was to stem the tide. This is probably the right thing to do, because people have spoken up and said what they want to see and how they want to see it”*.

It is important for civic participation when the initiative comes from below, when residents are ready to take responsibility for the future fate of an area or object: *“We wanted to do everything ourselves, without spending budgetary funds, and were even ready to take care of these trees or give money for it”* (Saint Petersburg 2).

Institutionalization of civic participation from above

When passing the process of institutionalization from above, in addition to improving the quality of life and creating a comfortable urban environment, the import of civil society institutions is added as a need, so the goals from the authorities are formed in the form of quantitative indicators: “To increase the proportion of citizens taking part in addressing the issues of urban environment by

2024 to 30%”. The creation of an order of action by the authorities is documented: Standards of integrated territorial development, Standard of citizen involvement in the solution of issues of urban environment development, Quality index of urban environment. In order to implement the goals, special organizations are assigned to represent the interests of municipal authorities. As an example of such organizations are regional competence centers on urban environment. At the stage of recognizing the legitimacy of the created institutions in the mass consciousness, the created structures are presented as legitimate mediators between the population, power and business. The spread of institutionalized forms of activity is carried out by involving citizens in public discussions, initiated by established organizations. At the final stage, a system of social (public) control is formed, which involves the structures created with the support of the authorities (All-Russia People's Front, public councils).

During the analysis of the materials presented on the information portals, changes in the institutions of urban environment development were identified. First, the number of participants in the development of solutions has increased. These are both public associations, which are the result of initiative from below (“Urban Projects”, “Beautiful City”, etc.) and structures created with the support of the authorities (national competence center “Smart City”, regional competence centers on urban environment). Hybrid structures are developing (for example, the public association “Urban Renovations”, the transition of the Institute of Urban Development of Bashkortostan to the status of a regional competence center on urban environment development). In one territory, both organizations formed with the assistance of the city authorities and associations created at the initiative of activists are simultaneously dealing with issues of urban development. Different actors organize discussions of projects of the same urban spaces,

that forces citizens to make a choice: which of the organizations represents their interests, whose project will be implemented. For example, when designing public spaces in the context of conflict of interest, municipal authorities turned to specialists from another region, refusing to work with the local architectural community (the project to improve the embankment in Vologda, the construction of the Okhta Center in Saint Petersburg). In addition, the limited number of local experts raises questions about the feasibility and effectiveness of multiple single-issue structures.

Second, in a competitive environment, the state plays an active role in the formation of urban development institutions, which is manifested in the adoption of a pool of documents of federal importance, the development of instruments of civic participation in the formation of the urban environment. For example, the Standard for citizen involvement in urban environment development, elaborated in 2020 jointly by the Ministry of Construction, Housing and Utilities and the Agency for Strategic Initiatives, regulates more than 20 formats of work with the population. According to O. Panchenkov, the scale of the project of the Ministry of Construction, Housing and Utilities “consistency will inevitably lead to the predominance of quantity over quality and form over content: the most important thing – what the project was created for – will disappear behind the words and figures used as a basis for reporting”⁷.

The creation of dual structures in the field of urban development is often not provided with resources, so there is a question about the effectiveness of their activities. Thus, the All-Russia People's Front inspection revealed the inefficiency of regional centers of competence in 28 constituent entities of the Russian Federation

⁷ Panchenkov O. The same cities: what is wrong with the approach of the Russian authorities to landscaping. *RBK*. November 24, 2017. Available at: <https://www.rbc.ru/opinions/society/24/11/2017/5a17d5c59a7947545c001e90>

in 2019, the reasons for which were: understaffing due to insufficient funding; mismatch of attracted specialists with the planned amount of work; transfer of the focus of work performed by regional competence center from the development of the urban environment to the solution of specific tasks (for example, the issue of municipal solid waste)⁸.

Third, one should note the low level of involvement of citizens in the process of discussing urban development, and their lack of clearly articulated interests in this area.

Expert 1: “We have the most active people – those who are dissatisfied with something. And when a good thing needs to be supported, everyone disappears. There is very little activity in this respect. As with Pirogov Boulevard, when you suggest: “People, come out, see what is fine with you, you will live here, this will be your place. There is no one there”.

Expert 2: “Residents begin to come out only when something is already beginning to be done. When things are discussed, no one comes out”.

Studies of consumer demands and behavioral scenarios of citizens reveal discrepancies between residents' ideas of what they need in the adjacent territory, and what they use. “Citizens simply overestimate their activity. For example, a third of those surveyed claimed to use free Wi-Fi in their yards. In fact, network connections were sporadic in summer and absent in winter. Many said: we want to do sports. At the same time, few came to sports grounds and courts”⁹.

Fourth, there is no common vision for the development of the urban environment. In the project of the Ministry of Construction, Housing and Utilities it goes under the slogans “Everything starts with yards” and “Modern public areas”.

⁸ ONF monitoring: Competence centers work ineffectively in 28 regions. Available at: <https://onf.ru/2019/10/24/monitoring-onf-v-28-regionah-centry-kompetency-rabotayut-neeftivno/>

⁹ Why it is necessary to involve residents in the formation of the urban environment. *Rossiyskaya Gazeta*, 2020, October 14. Available at: <https://news.myseldon.com/ru/news/index/238978643>

Each urban project is developed in the context of the overall concept and is focused on the needs of residents, harmonizing the interests of different groups. Actually, citizens are actively involved only in the design projects of individual public areas, because most often the development of the city is interpreted by the municipal authorities as the development of public spaces, and the course of action and indicators in this case are formalized at the level of the state. *“We have no strategy or planning for new facilities”* (Saint Petersburg 2).

The projects carried out under the comfortable urban environment program provoke both positive and dissatisfied responses related to their monotony: *“If you follow the implementation of the comfortable urban environment program, think ten times before you ask to include the square in this program. They won’t put lights there, but they will cut everything down and pave it with blocks. They will lay out flowerbeds, build playgrounds, put benches... In general, the square will not be a green area”* (Nizhny Novgorod).

Fifth, the result of joint action, such as the consolidation of the local community and the appropriation of territories, is not clearly visible.

Expert 1: “And the city administration went to such an expensive project, despite the fact that our budget is not so good. They try to make it convenient, comfortable, beautiful, well-designed for citizens. And our citizens at the same time manage to break something, there is no proprietary attitude. Maybe it is the environment, maybe it’s a problem of a culture that lacks a thrifty attitude”.

We conclude that **only the first two stages of civic participation are implemented on a large scale in practice**: informing and consulting. The main trends of citizen participation in the development of the urban environment are the allocation of target audiences and the design of public spaces according to their interests using various tools. Other stages of civic participation – partnership, delegation of authority – are not fully implemented. The pioneers

of participatory design in Russia, the founders of “Project group 8”, N. Snigireva and D. Smirnov, point out that the process of citizen involvement becomes “streaming” formal in nature [37, p. 62].

Discussion and conclusions

Undoubtedly, the production and change of urban space act as “an arena of coexistence of institutional and extra-institutional practices” [6, p. 103; 7, p. 448]. We show that the processes of typification, institutionalization, and legitimization elevate new forms of interaction and modify social roles and statuses to the rank of “habitual”, with the direction of institutional change depending on the sociocultural context. The conclusions drawn about the mechanisms of transformation are consistent with the views of other researchers. For example, T. Burns and T. Diez show that in local communities the spread of individual local initiatives leads to the transformation of established institutional mechanisms and practices at the overall level [38].

In the processes of formation of civic participation practices initiated by activists or the state, similarities and differences stand out. Both processes (from below and from above) include the stages of “recognition of the legitimacy of social movements in the system of state power”, “recognition of legitimacy in the mass consciousness”, “spread of institutionalized forms of activity”, but diverge as to the order of their passage. The processes also differ in the nature of institutional changes, actions and relations, the structure of political opportunities, and the passage of stages of civic participation (*Table*).

Institutional changes can be discrete or incremental, spontaneous or purposeful. Gradual changes are provided by incorporation into the trajectory of their previous development or the impact of a series of small events [39]. State intervention with the strategy of importing formal institutions can give a more discrete character to the process in the institutionalization from above.

Characteristics of the processes of institutionalization of civic participation
in the development of the urban environment in Russia

Indicator name	Institutionalization from below without conflict of interest	Institutionalization from below in conflict of interest	Institutionalization from above
The nature of institutional changes	Incremental, spontaneous	Incremental, spontaneous	More discrete, targeted
The nature of the relationship	Asymmetrical	Asymmetrical	Symmetrical
The nature of action	Small-scale, independent	Both small-scale and large-scale, independent	Both small-scale and large-scale, institutional support
Type of institutional changes	Changes in terms of informal norms	Transformation of social institutions (formal and informal norms)	Reproduction of social institutions
Structure of political opportunities	Open	Closed. Possibly with a transition to open in the conditions of support for the actions of activists from the broad masses	Closed – for independent public associations; open – for those created by the authorities
Stages of civic participation	Implementation of all stages of participation up to “partnership” and “taking responsibility”	Residents are ready to take responsibility. The partnership stage can be realized in cases of widespread support before the partnership of government and citizens is replaced by “imitation of a dialogue”	Only the first two stages of civic participation are implemented on a large scale in practice: informing and advising. The other steps – partnership, delegation of authority – are not fully implemented
Source: own compilation.			

In institutionalization from below changes are spontaneous, while in the formation of social practices from above changes in institutions have a purposeful nature.

Institutionalization from below without conflict of interest is accompanied by small-scale, independent actions. The nature of activist' actions in the presence of a conflict of interest remains independent, but their scale may be larger. In institutionalization from above, the actions of citizens have an institutional base.

The structure of political opportunities in the formation of social practices from below without a conflict of interest is open, but activists are most often independent of it. When there is a conflict of interest, the structure is closed, but when the actions of activists are supported by the broad masses, the transition to openness is possible. As we have already emphasized, in the institutionalization of civic participation from

above the structure of political opportunities is closed for independent public associations and open – for associations created by the authorities. The activists' resources include opportunities to enter the public space [8, p. 112].

Institutionalization from below without conflict of interest represents changes in the part of informal norms. In the presence of a conflict of interest, the content of the process of practices' formation consists in the transformation of social institutions (formal and informal norms). The formation of social practices from above in its essence is the reproduction of social institutions, but it is in the sphere of urban development that the process follows the type of “import of institutions”, which is indirectly evidenced by its speed. N. Snigireva notes: “Such changes in Russia in two or three years is extremely fast. At the EDRA (Environmental Design Research Association) conference, we talked to representatives from

many countries, and they all said: “What happened in your country in such a short time took decades in our countries. And Henry Sanoff says there are countries where it will never happen in this format”¹⁰. E.A. Shuklina and M.V. Pevnaya are of the opinion that Russia is now actively formalizing social participation, but formal norms are outside the interest of young people [6, p. 104-105]. An empirical study of citizen involvement in the development of the urban environment in Saint Petersburg has drawn conclusions about the significant development of two levels of citizen involvement in the development of the urban environment: informing and consulting [40]. Other researchers do not exclude the existence of contradictions between civic initiatives and territorial macrodevelopment programs that reflect the interests of local authorities [7, p. 458].

Our results partially overlap with the data of A.A. Zhelnina and E.V. Tykanova, who consider the scenarios of urban conflicts development depending on the nature of players and arenas [32]. In this direction we see the further development of the study, namely the inclusion in the mechanisms of sustainable practices’ formation of civic participation of the choice features of the arenas’ configuration (situational and formal), the behavior of various players (both leaders and players embedded in the management systems).

So, the formation of social practices of civic participation in the development of the urban environment is realized in two directions: from below through habitualization or from above as an import of social institutions. The state, realizing the importance of the problem of the quality of life, comfortable and safe urban environment, formalizes and controls the actions of stakeholders. The loss

of the stages of “partnership” and “delegation of authority” in the process of institutionalization from above suggests the formal and imitative nature of practices of civic participation in urban development. Citizens are increasingly aware of the need to assert their rights to the territory, but further steps are needed to make the fashionable slogan “right to the city” a tool to consolidate the urban community, and “the created institutional structures would not turn from a means to an end, something self-sufficient” [41, p. 120]. It is necessary to consolidate the efforts of the government, which declares its interest in citizen involvement, and of activists whose collective actions make it possible to realize all stages of civic participation, abandoning the position that the institutional and extra-institutional arenas are opposed to each other.

Certainly, activists’ accumulated experience contributes to the creation of civic infrastructures, but the weak involvement of the general public in social practices, the lack of support of initiative citizens from the population can further have a demotivating effect on the processes of civic participation.

Scientific novelty of the undertaken research lies in the definition of mechanisms for the formation of sustainable practices of citizen participation in the urban environment formation, the conclusions about the presence of two directions of processes: institutionalization from below in the form of habitualization and institutionalization from above. From the theoretical point of view, it is also quite significant to compare the main characteristics of the two types of institutionalization. The conclusions about the need to transfer the positive experience of activists and consolidate the efforts of institutional and non-institutional subjects of urban development are of practical importance. The results obtained complement the research conducted by the VoIRC RAS staff on the directions of strategic urban development [42].

¹⁰ Participatory design: definition, history, and practice. *Institute for Urban Development of Bashkortostan*. Available at: <https://irgrb.ru/participation>

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Appendix

Table 2. List of materials included in the analysis of texts

No.	Settlement	Topic	Source
1	Moscow 1	How to decorate the yard with flowers: Moscow residents grow front gardens on the adjacent territory	https://www.msk.kp.ru/daily/27028.4/4091424/
2	Blagoveshchensk	"The most blooming yard" in Blagoveshchensk	https://www.amur.info/culture/2018/09/1/9157
3	Yekaterinburg 1	Volunteers revived the historic garden in the city center in Yekaterinburg	https://varlamov.ru/4051916.html?utm_source=facebook.com&utm_medium=social&utm_campaign=problema-mnogih-rossiyskih-gorodov-v-tom
4	Moscow 2	How a century-old Moscow entrance hall is returned to its historical appearance	https://strelkamag.com/ru/article/potolok?utm_source=strelkamagt&utm_medium=social&utm_campaign=potolok
5	Bogatoye settlement, Samara Oblast	Tom Sawyer fest: the rural area needed a hero	http://tsfest.ru/
6	Yekaterinburg 2	Church of St. Catherine construction	https://news.ru/society/mer-ekaterinburga-opros-vciom-ohrame-nichego-ne-reshaet/
7	Korolyov	Let's preserve the Ryabinov Park	https://vk.com/video-188873215_456239026?t=46s
8	Nizhny Novgorod	Let's save the square in the Prioksky District	https://vk.com/save_prioksky_square_nn
9	Vologda	Against the project of improving the bank of the Vologda river embankment	https://vk.com/vologdareka http://vologdareka.tilda.ws/
10	Saint Petersburg 1	Opposing the construction of Okhta Center	https://www.save-spb.ru/
11	Saint Petersburg 2	The "Trees of St. Petersburg" movement (Mariya Tinika)	https://vk.com/spbtree https://luna-info.ru/discourse/derevy-peterburga/

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Self-Preservation Behavior: Generational Aspect*



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Abstract. The purpose of the research is to identify features of self-preservation behavior in different actual generations of Russians to assess the vector of their transformation and the prospects for life expectancy dynamics. The relevance of the topic is determined by the significant lag between Russia and developed countries in terms of life expectancy, largely due to behavioral factors. The scientific novelty consists in the fact that we can adapt the Strauss-Howe generational theory to study generational characteristics of population behavior related to health. By the results of a sociological survey, we have verified the hypotheses about the nature of self-preservation behavior models of five ten-year-old actual cohorts of the population and the combined generation born before 1955 inclusive. Regarding the ratio of self-preservation behavior models of the two oldest cohorts, the paper does not confirm the formulated hypothesis, which may be due to the positive transformation of health-preservation behavior models as people became older, due to changes in health status, as well as in the population of the older cohorts due to high premature mortality in groups with the most unfavorable lifestyle. Regarding four young actual generations, the study has confirmed the hypotheses showing that favorable socio-economic and demographic conditions, anti-alcohol and anti-smoking measures of the 2000s and promotion of an active healthy lifestyle in general have a positive effect in terms of influencing the nature of self-preservation behavior of young cohorts, which indicates the possibility of influencing behavioral health factors at the stage of its formation. The positive vector of transformation of generational patterns of self-preserving behavior, especially clearly manifested in men, allows us to hope for the restoration and prolongation of the growing dynamics of the life expectancy of Russians with the probability of achieving targets in the future, provided that favorable behavioral patterns in the field of health conservation are consolidated.

Key words: life expectancy, behavioral health factors, healthy lifestyle, self-preservation behavior, self-destructive behavior, generational theory, actual generation.

Introduction

In the context of the COVID-19 pandemic, there was a noticeable increase in the mortality rate of the Russian population. In 2020, the overall ratio increased to 14.6 per 1,000 population, compared to 12.3 in 2019. Life expectancy after a 16-year growth period, which led to an increase of 8.5 years (from 64.8 in 2003 to 73.3 years in 2019) with the achievement of the highest values in the history of the country, decreased by almost two years: to 71.5 years¹. Against the background of developing the epidemiological situation, by the middle of 2020, an adjustment was made to the national goals, announced in 2018 in the field of population life expectancy which provided for an increase in the life expectancy of Russians to 78 years by 2024, to

80 years by 2030². According to the Presidential Decree of the Russian Federation, dated July 21, 2020, the target of 78 years is set for 2030³.

Even after the adjustment, this is a very difficult task especially taking into account the previous very significant growth in the indicator, when relatively easy-to-implement opportunities for its increase were largely used, and 2020 failure which reflected the impact of new strong negative conditions. But

² On the national goals and strategic tasks of the development of the Russian Federation in the period through to 2024: Presidential Decree of the Russian Federation no. 204, dated May 07, 2018. Available at: <http://www.kremlin.ru/acts/news/57425> (accessed: July 12, 2020).

³ On the national development goals of the Russian Federation on the period through to 2030: Presidential Decree of the Russian Federation no. 474, dated July 21, 2020. Available at: <http://kremlin.ru/acts/news/63728> (accessed: July 12, 2020).

¹ Official website of Rosstat. Available at: <http://www.gks.ru> (accessed: July 12, 2021).

the goal set in the field of life expectancy of the Russian population is not an abstraction; it is a level that has been characteristic of a significant number of states for a long time. According to the UN, in 2019, life expectancy at birth was higher than 78 years in 45 countries including 27 European countries, Albania and Estonia are among them⁴. Life expectancy in the European Union as a whole has been steadily exceeding 78 years since 2004, and 80 years since 2011. In 2019, the indicator for both genders reached 81.3 years in the EU-27 (84.0 years for women, 78.5 years for men). For 26 EU-27 countries (except Ireland), as well as for EFTA countries (Iceland, Liechtenstein, Norway, and Switzerland), Eurostat has published preliminary data for 2020: in 22 of these 30 European countries, life expectancy, even after a decline in the pandemic, exceeds 78 years⁵.

Achieving this goal (getting closer to achieving it) depends on many factors that cause Russia to lag behind developed countries in life expectancy, and not least on the population lifestyle, the citizens' attitude to their health, their behavior in the field of health preservation, prevalence of health-saving, self-preservation behavior models in society. Russian researchers often note the wide spreading among the country's population of hygienically irrational and harmful habits and behavioral stereotypes: alcohol abuse, smoking, irrational nutrition and overeating, untimely seeking medical help⁶, and the lack of formation of behavioral patterns among Russians responsible for maintaining health and increasing the duration of active life [1]. At the same time, the classification of factors for ensuring the health of a

modern person, developed by experts of the World Health Organization back in the 1980s, is widely known, according to which more than 50% of factors (and according to recent data – about 70%) lies in the area of responsibility of the individual himself [2]. Significant life expectancy and longevity are primarily associated with maintaining health throughout a person's life which determines the relevance of studying the existing attitude to health at the level of individual and public consciousness.

The transformation of self-preservation behavior models can become one of the forms of health promotion and increasing the life expectancy of the Russian population [1], therefore, in our opinion, the study of attitudes to health among different actual generations by birth year (cohorts) is of particular interest. A steady increase in the population life expectancy is possible only when the younger generations form more positive models of self-preservation (health-saving) behavior than the older cohorts, and their implementation during life. The article aims to identify the features of self-preservation behavior in different actual cohorts of Russians, which will allow assessing the transformation vector of the existing models of self-preservation behavior in society and the prospects for life expectancy dynamics.

Theoretical foundations of self-preservation behavior research

The scientific community's interest in health problems and the behavior that causes it began to grow steadily in the second half of the 20th century, when, as a result of the completion of the first stage of the epidemiological transition in developed countries, diseases caused by endogenous (internal) behavioral causes took the first places in the structure of morbidity and mortality. In this regard, the issues of studying behavioral features that affect a person's health and life expectancy have become relevant in order to identify the strategies and opportunities for managing them. In Russian

⁴ Life expectancy and healthy life expectancy, data by country. World Health Organization (2020). Available at: <https://apps.who.int/gho/data/node.main.688> (accessed: July 13, 2020).

⁵ Statistics Eurostat. Available at: <https://ec.europa.eu/eurostat/databrowser/view/tps00205/default/table?lang=en> (accessed: July 13, 2020).

⁶ Kvasha A.Ya. et al. *Modern Demography: Study Aid*. Moscow: Izd. Mosc. Un-ta, 1995. P. 47–49.

sociology and psychology, this type of demographic behavior has been called self-preservation behavior. The term was first used in sociology and sociological demography since the early 1970s to describe a person's readiness to preserve their own life and health, to prolong existence until old age.

Foreign experts first studied people's behavior for the purpose of self-preservation within the framework of the "health promotion" concept [3], later the terms "health behavior", "health-related behavior", and "healthy lifestyle" appeared [4]. Most foreign studies of healthy lifestyle follow its definition as any activity performed by a person who considers themselves healthy in order to prevent the disease or detect it at an asymptomatic stage [5]. Based on the assumption that the behavior, aimed at health-protecting and health-promoting, can be considered as complementary components of healthy lifestyle, the following health promotion model was proposed: a paradigm for explaining behavior, aimed at maintaining health. According to the authors, the healing behavior is aimed at increasing the level of well-being, self-actualization and personal fulfillment [6]. A positive approach to life acts as a supportive component of health-enhancing behavior, as it contributes to potential realization. To monitor a healthy lifestyle, a group of researchers have developed a health-promoting lifestyle profile (HPLP) [6; 7]; it includes an assessment of six aspects of health-related behavior: "spiritual growth": focusing on the development of internal resources; "interpersonal relations": the use of communication to achieve a sense of intimacy with others; "nutrition": the choice of a healthy daily diet; "physical activity"; "health responsibility"; "stress management".

Some foreign studies use the term "self-preservation behavior", which is usually not considered as a synonym for the "healthy lifestyle" concept. Self-preservation behavior includes precautions used by people to reduce the risk

of harm to their health. At the same time, the concept can be used literally as carrying an object of self-defense: for example, not to go out at night, lock doors at night, avoid visiting places with increased danger, etc. [8; 9; 10]. In general, in foreign research, devoted to the study of self-preservation behavior, this term is used to a greater extent when studying professional groups in the context of attitudes to their health touching on issues related to the risk of injury at work, i.e. self-preservation behavior is considered as a certain set of human actions in professional activity, aimed at maintaining human productivity and preserving the body integrity [11].

Russian scientific community studies self-preservation behavior within the framework of medical, psychological, and socio-demographic approaches. The medical approach equates this type of behavior with healthy lifestyle (or a lifestyle that promotes health) reflecting the peculiarities of a person's behavioral activity in relation to their own health, i.e. not the motives and values of self-preservation are taken into account, but only the person's health-saving activity [12]. Social psychology interprets self-preservation (health-saving) behavior from three positions: as an act of decision-making; as a stage process; and as an activity. It is usually considered as a specific regulatory activity to ensure an optimal level of health for the individual [13]. In other words, unlike foreign studies, in which self-preservation behavior is primarily associated with a reduction in the risk of various injuries in the workplace, Russian psychology considers self-preservation behavior as health-oriented behavior and prevention of disease development.

Within the framework of the socio-demographic approach, self-preservation behavior is understood as a system of actions and personal relationships aimed at maintaining health throughout the life cycle and prolonging life. The first Russian

theoretical and empirical sociological studies on people's ideas about the desired and remaining life expectancy in combination with conditions conducive to its increase, were conducted in 1984–1990 under the leadership of A.I. Antonov. The majority of Russian researchers of this social phenomenon (I.S. Vyalov, I.V. Zhuravleva, L.S. Shilova) adhere to the definition of self-preservation behavior, proposed by A.I. Antonov, as a system of actions and attitudes of the individual, aimed at preserving health during the full life cycle, at extending the life span within this cycle⁷.

D.S. Kornienko connects self-preservation behavior with activity, aimed at maintaining physical and psychological health [14]. V.Ya. Shklyaruk defines it as a set of knowledge, motives, beliefs, systems of actions and relationships that organize and direct the person's volitional efforts to preserve health, a healthy lifestyle during the full life cycle, to prolong creative longevity [15]. S.A. Vangorodskaya identifies self-preservation behavior as an individual's conscious activity, aimed at maintaining optimal parameters of biological, psychological and social health and minimizing subjectively perceived risks [2].

In current research, the term “self-preservation behavior” has the following synonyms: “health-conscious behavior”⁸, “health-saving behavior”⁹ [16; 17], “health-related behavior” [18], “vital behavior”, and “life-saving behavior”. Despite the variation in the conceptual framework, their

general meaning comes down to the priority for individuals of the value of health, motivation and intense activity to save it [2].

A number of Russian authors identify the definition of “self-preservation behavior” with the concept of “healthy lifestyle”. M.D. Petrash and I.R. Murtazina [19] have made an attempt to comprehend these concepts in the context of health psychology, their correlation and identification of similarities and differences; the authors believe that these definitions are closely related to each other, but not identical. In the authors' opinion, self-preservation behavior is an integral element of a healthy lifestyle. The concept of “healthy lifestyle” is broader than self-preservation behavior, and can be defined as a set of external and internal conditions of human activity that contribute to the longer work of all systems of the body, as well as a set of actions, aimed at preserving and strengthening health (self-preservation behavior) and personality harmonious development.

Today, there have been conducted quite a large number of empirical studies of self-preservation behavior. On the basis of the Center for Sociological Research of the Belgorod National Research University, a scientific project is being implemented related to the study of risks and trends of self-preservation behavior of the population of the Russia's central regions in order to identify the influence of socio-political, socio-economic, infrastructural and socio-psychological groups of factors in the formation of self-preservation behavior models [1; 2; 20]. In cooperation with colleagues from other Russian and Belarusian research organizations, Vologda Research Center of RAS [17; 21–25] conduct the studies of self-preservation behavior as the basis for the formation of public health, its regional characteristics, specifics in rural areas, and gender aspects of health protection. The Institute of Sociology of National Academy of Sciences of Belarus are studying the

⁷ Antonov A.I. *Family Microsociology (Methodology for Studying Structures and Processes)*. Moscow: Nota Bene, 1998. 313 p.

⁸ Volkova M.B. *Public Health-Saving Behavior in the Context of Russian Socio-Economic Transformations: Cand.Sci. (Soc.)*, Thesis Abstract. Saratov, 2005. 27 p.

⁹ Pozdeeva T.V. *Scientific Substantiation of the Concept and Organizational Model of the Formation of Students' Health-Saving Behavior: Doc.Sci.(Med.)*. Thesis Abstract. Moscow, 2008. 47 p.; Zelionko A.V. *Justification of Organizational and Preventive Measures to Improve the System of Formation of Health-Saving Behavior and Improving the Quality of Life of the Population: Cand.Sci.(Med)*. Thesis Abstract. Saint Petersburg, 2016. 193 p.

problems of preserving health, orientation of the population to a healthy lifestyle, self-preservation behavior of young people, self-preservation behavior in the territories, affected by the Chernobyl Nuclear Power Plant, as well as practices of self-destructive behavior (alcoholism, tobacco smoking, drug addiction) [3; 17; 26]. The generational aspect of the study of self-preservation behavior primarily covers research in the youth audience¹⁰ [3; 26–29] which is definitely of the greatest importance for assessing the prospects of health and life expectancy of the population. At the same time, the lack of comparative intergenerational studies of self-preservation behavior, which provide a comparison base for such assessments, highlights the necessity to study on the features of self-preservation behavior of different actual cohorts of the population. The study of self-preservation behavior becomes especially relevant in the COVID-19 pandemic [25; 30].

Materials and methods

The general scientific methods of analysis, synthesis, comparison, and generalization form the methodological basis of the research. To achieve the goals and tasks, we have used a system approach, comparative analysis, sociological research methods, cohort method of demographic analysis, and tabular data. The theoretical basis of the research includes scientific works of leading demographers, physicians, sociologists, psychologists on life expectancy, public health, self-preservation behavior, and the Strauss-Howe generational theory. The information base comprises official data of Rosstat and the findings of the sociological survey “Public health and quality of life”, conducted in December 2020 in the Komi Republic. By means of a handout questionnaire on a quota sample covering all 20 municipalities of the

republic, 1,533 people aged 15 years and older were interviewed; 76.3% of the respondents belong to urban population, 23.7% to rural population, which corresponds to the distribution of the population of the specified age by types of settlements. The age structure of the sample array is somewhat younger than the general population. The proportion of young respondents (from 15 to 54 years of age) exceeds the same proportion in the population aged over 15 almost uniformly at the expense of each five-year age group. As the respondents’ age (generational) affiliation is the main section of the analysis of the survey results, the features of the age structure of the sample array will be taken into account. And regarding the importance of young age groups for determining the transformation vector of self-preservation behavior models, such a distribution can be considered successful. Men are reluctant to take part in surveys, therefore, by gender, the respondents’ array also differs from the general population. In order to clear the survey results from the influence of the gender imbalance of the sample, we have included gender as an additional section of the analysis. The questionnaire contains 51 questions, 25 of them relate to the respondents’ health to one degree or another and their model of self-preservation behavior, as whose structural components, such as relations with the health care system, lifestyle activity, nutrition and prevalence of bad habits, are considered in the study. For a comparative intergenerational analysis of the features of self-preservation behavior, we have selected questions in which the influence of age is eliminated to the maximum extent: the prevalence of bad habits that have significant stability with age, as well as an active sports lifestyle, which, in the absence of the influence of strong negative factors, is also a habit that persists throughout life. We have carried out the processing and analysis of sociological data using MS Statistica and MS Excel programs.

¹⁰ Pozdeeva T.V. *Scientific Substantiation of the Concept and Organizational Model of the Formation of Students’ Health-Saving Behavior: Doc.Sci.(Med). Thesis Abstract*. Moscow, 2008. 47 p.;

Results and discussion

To analyze the generational aspect of self-preservation behavior, we have used some provisions of the Strauss-Howe generational theory [31; 32], which is based on the statement that the key element in determining the time frame of any generation is the category of values. The generational theory distinguishes not just age groups, but generational groups of the population with similar basic values formed under the influence of social, economic and political conditions, i.e. the surrounding social environment and the norms of family education typical of the period of socialization of representatives of the generation. The case of the USA confirms the validity of the generational theory, but it turned out to be questionable for other countries, as the process of forming values of different generations depends on the characteristics of socio-economic and political development of different states. Taking into account the specifics of historical development, the generational theory can be adapted to the realities of another country, but the goals of the analysis should also be taken into account. For example, I.M. Gurova and S.Sh. Evdokimov have adapted the Strauss-Howe generational theory to study the formation and development of Russia's labor potential [33]. Based on the analysis of the main historical events of our country, five generations were identified and described. These generations differ from value orientations, needs and interests, attitudes to work, motivations and other attitudes that are important to consider when improving labor

opportunities. When analyzing generational features of self-preservation behavior, the periodization of Russian generations will be somewhat different, as other factors influence the self-preservation behavior models. In addition, we should consider that the features of self-preservation behavior of different generations, formed under the influence of conditions characteristic of their socialization period, change with age due to objective changes in health status.

Moving from the age groups of the respondents in the survey "Public health and quality of life" to their birth years and the approximate period of socialization completion (i.e., reaching 15 years), we consider six actual generations by birth year: over 65 years in general (including those born up to 1955) and five younger ten-year cohorts which, in our opinion, may differ in self-preservation behavior models, as they are characterized by a noticeable differentiation of the conditions of formation (*Tab. 1*). Undoubtedly, the designated boundaries of actual generations are very conditional. The main task of the analysis is to determine the transformation vector of self-preservation behavior as the basis of promising trends in life expectancy.

Interviewed in December 2020, respondents aged 65 and older were born until 1955 inclusive. Their socialization occurred in the war and post-war years, when population mortality was largely determined by unfavorable external factors and exogenous diseases. The socialization of the youngest representatives ended by the end of the 1960s, when diseases of the circulatory system only

Table 1. Actual generations with noticeable differentiation of conditions for the formation of self-preservation behavior models

no.	Age group of respondents	Birth year	Period of socialization completion	Conditions for the formation of self-preservation behavior models
1	65 and older	until 1955	until 1970	Unfavorable
2	55-64	1956-1965	1971-1980	More favorable comparable to the previous generation
3	45-54	1966-1975	1981-1990	More favorable comparable to the previous generation
4	35-44	1976-1985	1991-2000	Extremely unfavorable
5	25-34	1986-1995	2001-2010	More favorable comparable to the previous generation
6	15-24	1996-2005	2011-2020	More favorable comparable to the previous generation

came out in Russia in the first place in the structure of death causes, but at the same time, on the second place, there was external causes (accidents, etc.), i.e. attention to the behavioral aspects of health in society had not yet taken shape. Representatives of older generations have formed unfavorable models of self-preservation behavior, and it causes high mortality rate. However, by the age of 65, they have certainly undergone a noticeable positive transformation due to age-related changes in the health state that require a more responsible attitude to it. In addition, taking into account the specifics of Russian mortality by age and death causes, we can argue that not so much the healthiest representatives of generations live up to older ages, but the most responsible ones in terms of self-preservation behavior.

Respondents aged 55–64 were born in 1956–1965; they socialized mainly in the 1970s, when demographic statistics, previously almost classified, began appearing in the Russian mass media. At that time, society had already paid attention to the stagnation of life expectancy, a significant lag in the male indicator, the prevalence of sedentary lifestyle (hypodynamia) and bad habits among population. Presumably, in the generation born in 1956–1965 (given the above-mentioned conditionality of the boundaries of the actual cohorts considered in the article, it would be more correct to call it the generation of the second half of the 1950s – the first half of the 1960s), the self-preservation behavior models were more positive at the time of formation than in the older cohorts; in addition, they also could experience more positive changes associated with age.

In our opinion, the most interesting from the point of view of the purposes of the analysis are four young ten-year cohorts; they differ quite significantly in the conditions in which the formation of self-preservation behavior models mainly took place.

The respondents aged 45–54 were born in 1966–1975; they socialized in the 1980s, characterized by noticeable public attention to demographic problems in general starting with the Decree, dated 1981, “On measures to strengthen state assistance to families with children”¹¹, which is often called the only full-scale event of the demographic policy in the Soviet period. In the middle of the decade, in the country, there was an anti-alcohol campaign¹², which was later criticized more, but its short-term results turned out to be very impressive: in 1986–1987, the life expectancy of the Russian population exceeded 70 years for the first time. In addition, the fight against drunkenness was conducted not only by prohibitive measures; after a long break, regular mass media and permanent organizations promoting a sober lifestyle appeared in the country. In other words, the general mood of society during the period of the generation’s socialization of the second half of the 1960s – the first half of the 1970s can be considered conducive to the formation of more positive models of self-preservation behavior than those born in the previous decade.

Respondents aged 35–44 years were born in 1976–1985, their socialization took place mainly in the 1990s, which suffered from all kinds of crisis. At that time, there was a deep socio-political, socio-economic, moral, psychological and demographic crisis. The abolition of the state wine monopoly led to the filling of the alcohol market with low-quality products. Moon-shining for personal consumption, which became widespread after the Decree of 1985, took a commercial form.

¹¹ On measures to strengthen state assistance to families with children: Decree of the CPSU Central Committee and the Council of Ministers of the USSR, no. 235, dated January 22, 1981. *SP SSSR*, 1981, no. 13. 75 p.

¹² On strengthening the fight against drunkenness: Order of the Presidium of the Supreme Council of the USSR, no. 2458-XI, dated May 16, 1985. Available at: <http://docs.cntd.ru/document/9007335> (accessed: July 19, 2021).

The rapidly falling incomes of the population in conditions of unemployment and massive wage delays led to an unprecedented increase in the consumption of surrogate alcoholic beverages. Drunkenness and alcoholism have significantly rejuvenated. The term “beer alcoholism” appeared. Drug addiction has become a noticeable phenomenon in Russian society. As a result, in 1993, mortality from a group of accidents rose to the second place in the structure of causes of death in Russia. In 1994, the life expectancy of the Russian population dropped to the minimum level of 64.0 years after the completion of the first stage of the epidemiological revolution. This extremely unfavorable background, the signs of which can be continued listing, in our opinion, contributed to the formation of the lowest standards of self-preservation behavior in the generation of the second half of the 1970s – the first half of the 1980s, compared with the rest of the cohorts.

The survey participants aged 25–34 were born in 1986–1995; they socialized mainly in the first decade of the 2000s, characterized by an increase in living standards, and the beginning of a steady improvement in the demographic situation and implementation of modern Russian socio-demographic policy. The priority national project “Health” was launched on January 1, 2006. In the context of a significant decrease in mortality from injuries, in 2006, mortality from external causes fell to the third place in the structure of death causes of Russian population. In January 2007, a completely new measure of demographic policy in the field of fertility has appeared: maternity capital for the second child which has made a good advertisement for demographic issues in general. In October 2007, the “Concept of demographic policy of the Russian Federation for the period through to 2025” was approved, in which the tasks in the field of mortality were in the first place and specific guidelines were laid for increasing Russians’

life expectancy to 70 years by 2015, to 75 years by 2025¹³. In addition, in the 2000s, there were taken the important steps against smoking and alcohol legacy of the 1990s. Signed in 2001, the Federal Law “On tobacco smoking restriction”¹⁴ provided for a ban on the sale of tobacco products to minors, a restriction on advertising tobacco products, a ban on its sale in educational, medical, cultural and sports institutions, at a distance of one hundred meters from schools, colleges and universities, and other events. The norms adopted in the law were subsequently refined several times; the “National anti-smoking strategy” was signed in 2010. In 2005, the management system for the production, distribution and sale of alcohol was strengthened; a mandatory excise stamp was introduced on all alcoholic beverages and a ban on the sale of beverages with strength of more than 15% alcohol in certain public places. In 2008, alcohol advertising was banned on all types of transport and an increase in excise taxes by 10% per year was introduced. In 2010, the national action program to combat alcoholism for the period up to 2020 was adopted, the minimum retail price for drinks stronger than 28% ABV was established and zero tolerance for alcohol consumption by drivers (the so-called “zero ppm”) was introduced. The activities carried out and the conditions of socialization favorable in comparison with the 1990s, in our opinion, contributed to the formation of more positive models of demographic including self-preservation behavior in the generation of the second half of the 1980s – the first half of the 1990s, compared with the cohort of the second half of the 1970s – the first half of the 1980s.

¹³ Concept of demographic policy of the Russian Federation for the period through to 2025. Available at: <http://document.kremlin.ru/doc.asp?ID=041941> (accessed: July 12, 2021).

¹⁴ On tobacco smoking restriction: Federal Law no. 87-FZ, dated July 10, 2001. Available at: <http://www.kremlin.ru/acts/bank/17153> (accessed: July 19, 2021).

Respondents aged 15–24 were born in 1996–2005 and socialized mainly during 2011–2020. The decade is characterized by an increase in demographic policy both in the field of fertility (the introduction of regional maternity capital, etc.) and mortality including the implementation of regional health modernization programs the national action program to combat alcoholism for the period through to 2020, the national anti-smoking strategy, the launch of a new campaign for universal medical examination of the adult population, strengthening the promotion of a healthy lifestyle, etc. The country continues implementing steps to overcome the alcoholic legacy of the 1990s and tightening anti-smoking measures. In 2011, the control was strengthened, the severity of administrative responsibility for the sale of alcohol to minors was increased, and a ban on the sale of alcohol at gas stations was introduced. In 2012, the sale of beer in certain places was banned, as well as alcohol advertising on the Internet and in electronic media. In 2013, alcohol advertising was banned in any print media, there was an increase in the accuracy of breathalyzers and the severity of penalties for drunk driving; the Federal Law “On protecting citizens’ health from exposure to ambient tobacco smoke and the consequences of tobacco consumption”¹⁵ was adopted which introduced a complete ban on tobacco smoking in public places, tightened the requirements for packaging design (in particular, frightening pictures and inscriptions appeared on cigarette packs), continued practicing progressive tax increases, strengthening anti-tobacco campaigns, and banning on all types of advertising, sponsorship and promotion of tobacco products. In 2014, fines for selling alcohol to minors were increased and criminal liability for repeated violations was introduced. In 2015, ESAIS, an

automated system designed for state control over the volume of production and turnover of ethyl alcohol, alcoholic and alcohol-containing products, was introduced to register alcohol-containing products at the retail level. In the spring of 2020, in the context of the COVID-19 pandemic in Russia, as in all countries, a lockdown was applied, i.e. strict quarantine restrictions in order to stop the increase in the incidence of a new coronavirus infection in the population, which demonstrated that human health and life in modern society are valued above economic losses. Such a background, in our opinion, contributed to the formation of even more favorable models of self-preservation behavior in the cohort of the second half of the 1990s – the first half of the zero years of birth than in the generation born in the previous decade.

We have verified our hypotheses about the features of the nature of self-preservation behavior of the six cohorts based on the results of the sociological survey “Public health and quality of life”, conducted in December 2020. Of course, not all health questions, formulated in the survey, are suitable for analysis in a generational context, as age has a noticeable impact on generations’ health and the prevalence of self-preservation behavior practices. Most of all, in our opinion, questions concerning the prevalence of elements of self-destructive behavior, the so-called bad habits that have significant stability with age, as well as the prevalence of an active sports lifestyle, which, in the absence of the influence of strong negative factors, is also a habit that persists throughout life, are suitable for the intergenerational analysis of the features of self-preservation behavior. These questions make it possible to eliminate the influence of age to the maximum extent.

In general, answers to the question “Do you drink alcohol?” (*Tab. 2*) have confirmed the hypothesis about the most favorable model of self-preservation behavior in the youngest of the actual generations that we have considered, which has

¹⁵ On protecting citizens’ health from exposure to ambient tobacco smoke and the consequences of tobacco consumption: Federal Law no. 15-FZ, dated February 23, 2013. Available at: <https://www.garant.ru/products/ipo/prime/doc/70221478/> (accessed: July 19, 2021).

Table 2. Distribution in the considered actual generations of the answers to the question "Do you drink alcohol?", %

Respond option	Total	Actual generations, birth years					
		1996–2005	1986–1995	1976–1985	1966–1975	1956–1965	until 1955
Yes, I do	69.1	51.9	74.8	77.0	72.8	76.5	67.3
I used to drink alcohol	14.7	13.3	14.8	12.6	18.7	15.7	21.2
I have never drunk alcohol	16.2	34.8	10.4	10.4	8.5	7.8	11.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

been formed mainly in the previous decade. Almost 35% of representatives of the cohort born in 1996–2005 (32% among men and 36% among women) answered that they have never tried alcohol. At the time of the survey, they were between 15 and 24 years old, and almost 80% of survey respondents who consumed alcohol noted that they had their first experience before the age of 20.

Partly, this question has also confirmed the hypothesis about the low standards of self-preservation behavior of the generation born in 1976–1985, whose socialization mainly occurred in the 1990s. But the percentage of alcohol users among respondents from this cohort is not much higher than the level of the younger generation born in 1986–1995, and taking into account those who are off the alcohol, it does not differ at all. Consequently, we can assume that self-preservation behavior models, apparently, are formed somewhat earlier than the 15 years laid down in our hypothesis (for example, Howe and Strauss adhere to the age of 12), and in the older representatives of the generation born in 1986–1995, they were formed partly under the influence of the late 1990s, which,

like the first half of the decade, were characterized by extremely unfavorable trends in the level and lifestyle of the population in the conditions of hyperinflation that followed the default of 1998.

The question of alcohol consumption is also confirmed by the relatively favorable model of self-preservation behavior of the 1966–1975 cohort, which was formed mainly in the 1980s, not only in comparison with the generation born in 1976–1985, but also in comparison with the older generation born in 1956–1965. These patterns revealed for four young cohorts are more clearly expressed among men, but also among women.

Self-preservation behavior models of older generations, as already noted, are strongly influenced by age, as well as changes in the composition of the population due to high premature mortality in groups with the most unfavorable lifestyle including in terms of alcohol abuse. In any case, the answers to the question about alcohol consumption do not confirm our assumption regarding the correlation of self-preservation behavior patterns of the two older cohorts under consideration.

Table 3. Distribution in the considered actual generations of answers to the question "Do you smoke?", %

Respond option	Total	Actual generations, birth years					
		1996–2005	1986–1995	1976–1985	1966–1975	1956–1965	until 1955
Yes, I do	17.5	17.0	18.0	20.9	17.9	10.5	7.7
I smoked before	20.4	15.8	20.0	23.2	24.7	17.6	21.2
I have never smoked	62.2	67.2	62.0	55.9	57.4	71.9	71.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The respondents' answers to the question "Do you smoke?" have generally confirmed the hypothesis about the patterns of self-preservation behavior nature among four young generations: gradual deterioration from the younger generations to 1976–1985 cohort with further improvement in 1966–1975 cohort (*Tab. 3*). More than 67% of respondents belonging to the youngest of the considered actual generations (61% among men and 70% among women) have never smoked. The percentage decreases to the generation born in 1976–1985 and increases again in 1966–1975 cohort. In every actual generation, a very significant percentage quit smoking. It means that the favorable nature of the transformation of health-saving behavior in terms of smoking in recent years can be traced not only in the generational aspect, but also in the dynamics of the life of generations.

But unlike alcohol consumption, the question of smoking does not reveal the relatively favorable

nature of the self-preservation behavior of the generation born in 1966–1975 compared to the older cohort of 1956–1965. In our opinion, this is due not only to the fact that the most responsible representatives of generations in terms of health-saving behavior live up to older ages (which, in particular, shows a significant percentage among the survey participants who have never smoked men over the age of 60), but also to the fact that from about the cohort of the second half of the 1960s – the first half of the 1970s, smoking becomes quite common among women.

Distribution of answers to the question "How can you assess your lifestyle?" (*Tab. 4*) also confirms the most active health-saving behavior model in the youngest cohort born in 1996–2005 which was formed during the period of strengthening healthy lifestyle promotion. Almost a quarter of the representatives of this generation have noted that they follow fitness regime, in all other cohorts this

Table 4. Distribution in the considered actual generations of answers to the question "How can you assess your lifestyle?", %

Respond option	Total	Actual generations, birth years					
		1996–2005	1986–1995	1976–1985	1966–1975	1956–1965	until 1955
I follow fitness regime (gym, swimming pool, I go skiing, etc.)	14.2	24.3	12.0	11.7	8.9	.2	7.7
Every day I do morning exercises	11.0	8.0	15.6	8.6	11.1	15.0	21.2
From time to time, I go to the gym, swimming pool, skiing, etc.	26.1	27.3	33.2	25.7	25.5	19.6	7.7
I am not keen on sport, but regularly I do manual labor	21.2	16.5	22.4	21.8	26.4	25.5	9.6
The best remedy for health is garden plot: from spring to autumn I work in the country	14.9	6.3	11.6	14.9	16.6	34.6	30.8
I often walk in the fresh air, do Nordic walking, etc.	18.5	19.0	16.4	15.5	17.4	28.8	23.1
My lifestyle is inactive	21.5	21.6	18.8	23.2	21.3	19.6	26.9
Other	1.2	1.5	0.4	1.4	1.7	0.0	1.9
Total	128.6	124.6	130.4	122.7	128.9	152.3	128.8
No response	1.4	1.0	1.2	1.4	2.1	2.0	0.0

answer option is less common than the average in the array. Together with the option “From time to time, I go to the gym, swimming pool, I go skiing, etc.”, especially common among women, this hint forms more than 50% of the answers in the generation born in 1996–2005, and more than 45% of the answers in the generation born in 1986–1995. With regular exercise, it is about 60% in both young cohorts. For older generations, the corresponding figures are noticeably decreasing. In women, the prevalence of active sports is lower, but generational patterns are generally the same as in men.

Thus, the main research hypothesis for the purposes of analysis, that the two youngest cohorts of the six actual generations of the adult population differ in the most favorable models of self-preservation behavior, was confirmed on the basis of issues reflecting responsibility for health, characterizing attitudes to alcohol, tobacco smoking and active sports lifestyle.

Conclusion

Human health is largely determined by one's lifestyle and life attitudes. Longevity depends on what kind of lifestyle a person adheres to, what form of activity they prefer. Models of demographic including self-preservation, behavior of population are strongly influenced by the conditions of their formation. Hypotheses about the nature of self-preservation behavior models of five ten-year-old actual cohorts and the combined generation born before 1955, put forward using the developments of the Strauss-Howe generational theory, were verified by the results of a sociological survey.

Regarding the correlation of self-preservation behavior models of the two oldest of the six cohorts (born before the mid-1950s and in the second half of the 1950s – the first half of the 1960s), the hypothesis was not confirmed by the results of a sociological study. In our opinion, this may be due to the fact that self-preservation behavior models of older generations have been greatly transformed

with age due to changes in health status, as well as in the composition of cohorts due to high premature mortality in population groups with the most unfavorable lifestyle.

Regarding the four young actual generations, the study has confirmed our hypotheses. It showed that the generation of the second half of the 1970s – the first half of the 1980s, born in the conditions of the system crisis of the 1990s, formed the most unfavorable models of self-preservation behavior in terms of alcohol consumption and smoking (which confirmed the distribution of answers to the question “Have you ever tried drugs?”): worse than the older cohort of the second half of the 1960s – in the first half of the 1970s, the standards of health-saving behavior of which developed in the relatively prosperous 1980s, and significantly worse than the generations of the second half of the 1980s – the first half of the 1990s, and especially the second half of the 1990s – the first half of the zero years of birth, which formed the most positive behaviors in the field of health. Thus, favorable socio-economic and demographic conditions, anti-alcohol and anti-smoking measures of the 2000s and the promotion of an active healthy lifestyle in general have a positive result in terms of influencing the nature of self-preservation behavior of young generations, which indicates the possibility of influencing behavioral health factors at the stage of its formation.

The positive vector of transformation of generational patterns of self-preservation behavior, especially clearly manifested in men, allows hoping for the restoration and prolongation of the positive dynamics of life expectancy of the Russian population with the possibility of achieving targets in the future, provided that favorable behavioral patterns responsible for maintaining health and increasing the duration of active life are consolidated.

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Assessing the Impact of the COVID-19 Pandemic on the Economies of China and Russia*



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Abstract. The COVID-19 pandemic has significantly affected economic development in countries around the world. It aggravated existing problems and increased the demand for economic transformation, modernization and qualitative development, triggered a new technological reform, which led to the emergence of new economic business forms and new consumption. The article assesses the impact of the COVID-19 pandemic on the economies of China and Russia. To achieve this goal, we review the state of business activity in the manufacturing and non-manufacturing sectors of the national economy, and summarize the main measures of the anti-pandemic policy implemented by the Chinese and Russian governments. We look into the dynamics of functioning of offline economic spheres that are aimed at personal communication (tourism, catering, retail, transport, culture, entertainment), as well as online spheres implying human-computer interaction (electronic retailing, express delivery, remote work, telemedicine) in the context of the COVID-19 pandemic. We make conclude that the extent of COVID-19 impact on the economy depends on the effectiveness of measures for its prevention and control. We are convinced that at the moment it is necessary to correlate these measures with economic and social development policies, and take into consideration increased consumption as an important aspect of mitigating the effects of COVID-19, accelerate the transformation and modernization of traditional industries, actively develop new economic business forms and build a more open monetary circulation both within the country and globally, thus enhancing the role of the state in global supply chains.

Key words: China, Russia, COVID-19 pandemic, economy, impact.

Introduction

The COVID-19 pandemic and the resulting social distancing, isolation, and travel restrictions have changed people's lifestyles and production modes and affected global economic and social development. According to the World Bank, the volume of world trade as of the end of 2020 decreased by 9.5% compared to the previous year¹. The implications of the COVID-19 pandemic have affected almost all economic sectors in one way or another. Airlines and cruise companies, casinos and hotels faced a reduction in the number of tourists by almost 90% [1]. A sharp decline in demand for food products on the part of hotels and restaurants led to a 20% drop in prices for agricultural products [2]. Negative dynamics were observed in many industries, in retail trade, and in the world commodity markets (*Figures 1 and 2*). Oil prices collapsed by 34%, investment activity slowed down by 5.5%².

¹ Source: World Bank. 2021. Global Economic Prospects, January 2021. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-1612-3.

² Source: *Ibidem*.

As a result, global GDP dropped in the first quarter of 2020 by 8.1% compared to the level of the fourth quarter of 2019; the decline accelerated to 13.7% in the second quarter of 2020³. According to the results of 2020, GDP decline in the world is estimated at 4.3% compared to 2019 (*Tab. 1*). The decline and slowdown in economic dynamics were observed in most countries. At the same time, among major economies, China and Russia demonstrated one of the highest levels of resistance to the crisis caused by the COVID-19 pandemic.

The aim of our study is to assess the impact of the COVID-19 pandemic on the economies of China and Russia.

Prevention and control of the spread of COVID-19 in China and Russia

Prevention and control policies have become the foundation of China's pandemic response strategy. The emphasis was placed on strict discipline in terms of compliance with quarantine measures, mass testing, and preventive transition to working

³ Source: *Ibidem*.

Figure 1. Dynamics of global economic activity indicators in 2020, % to the level of December 2019

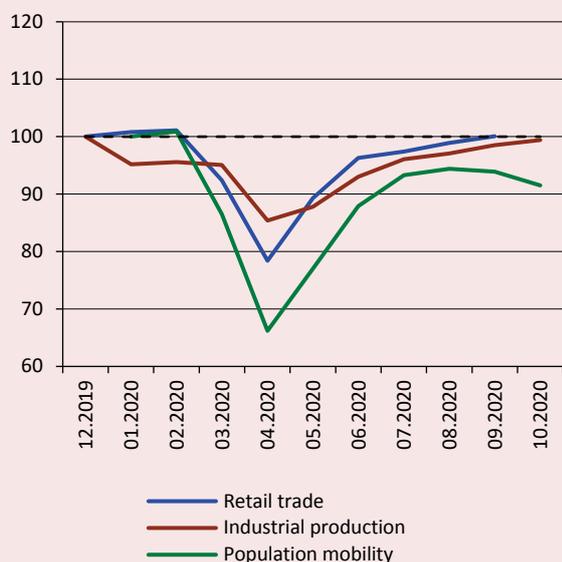
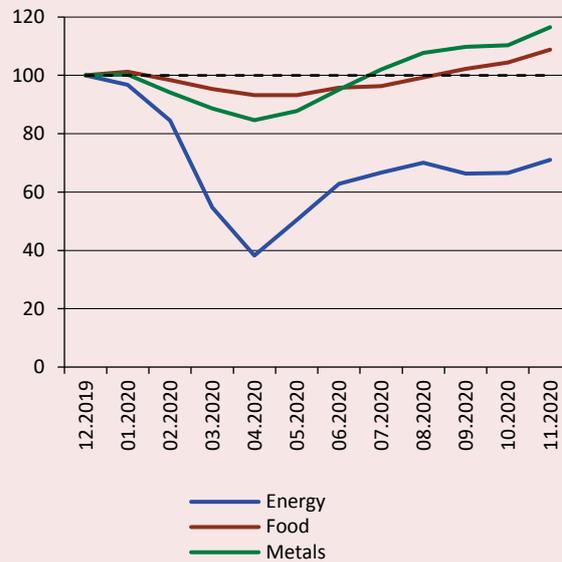


Figure 2. Dynamics of world prices for certain goods in 2020, % to the level of December 2019



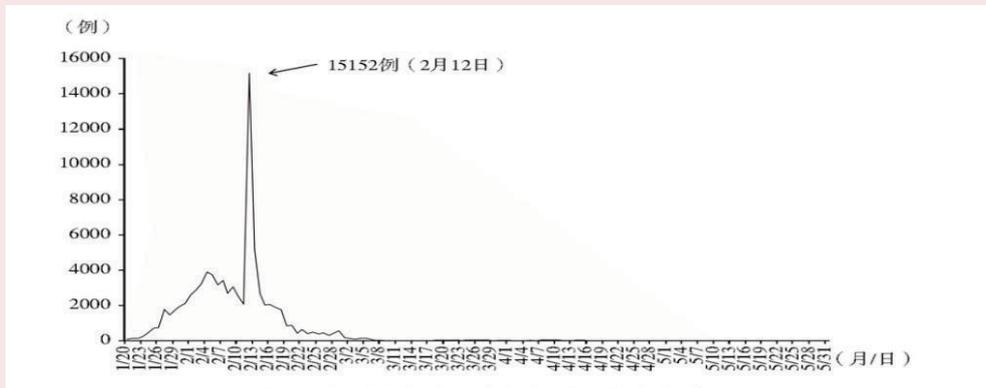
Source: World Bank. 2021. Global Economic Prospects, January 2021. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-1612-3.

Table 1. GDP growth rate, in % relative to the previous year

Country	2018	2019	2020 (estimate)	2021 (forecast)	2022 (forecast)
World	3.0	2.3	-4.3	4.0	3.8
Developed economies	2.2	1.6	-5.4	3.3	3.5
United States	3.0	2.2	-3.6	3.5	3.3
Euro area	1.9	1.3	-7.4	3.6	4.0
Japan	0.6	0.3	-5.3	2.5	2.3
Emerging markets and developing countries	4.3	3.6	-2.6	5.0	4.2
East Asia and the Pacific Basin	6.3	5.8	0.9	7.4	5.2
China	6.6	6.1	2.0	7.9	5.2
Indonesia	5.2	5.0	-2.2	4.4	4.8
Europe and Central Asia	3.4	2.3	-2.9	3.3	3.9
Russia	2.8	2.0	-3.0	2.6	3.0
Latin America and Caribbean countries	1.9	1.0	-6.9	3.7	2.8
Brazil	1.8	1.4	-4.5	3.0	2.5
Middle East and North Africa	0.5	0.1	-5.0	2.1	3.1
Saudi Arabia	2.4	0.3	-5.4	2.0	2.2
South Asia	6.5	4.4	-6.7	3.3	3.8
India	6.1	4.2	-9.6	5.4	5.2
Sub-Saharan Africa	2.6	2.4	-3.7	2.7	3.3
Republic of South Africa	0.8	0.2	-7.8	3.3	1.7

Source: World Bank. 2021. Global Economic Prospects, January 2021. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-1612-3; Rosstat.

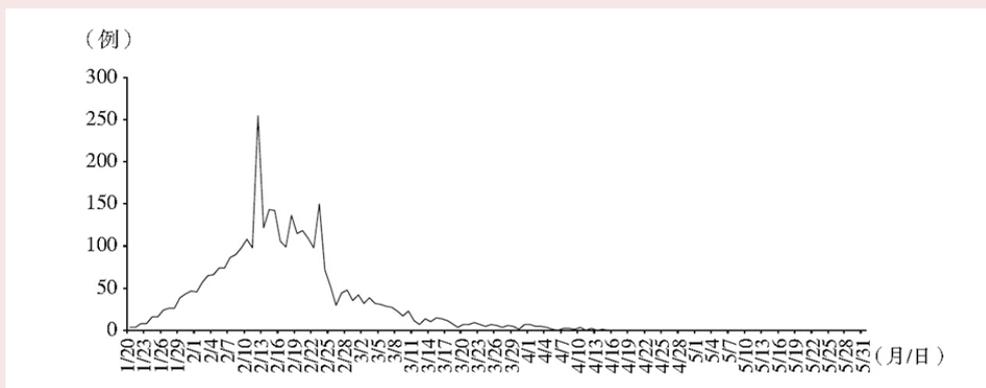
Figure 3. Daily new confirmed cases of COVID-19 in China



Note: 15,152 new confirmed cases of COVID-19 were reported on February 12 (13,332 clinically diagnosed cases in Hubei province were counted as the new confirmed cases on that day)

Source: *Fighting COVID-19: China in Action*.

Figure 4. Daily number of COVID-19 deaths in China



Source: *Fighting COVID-19: China in Action*.

from home. It took China just over a month to establish a preliminary control of the spread of COVID-19, about two months to reduce the number of daily new cases to less than ten, and about three months to achieve convincing results in the fight against COVID-19 in Wuhan and

Hubei, and also obtain significant strategic results in COVID-19 prevention and control (Fig. 3, 4)⁴. Currently, the COVID-19 situation in China is under control, but due to imported cases, there are still periodic outbreaks of the virus in different regions of the country.

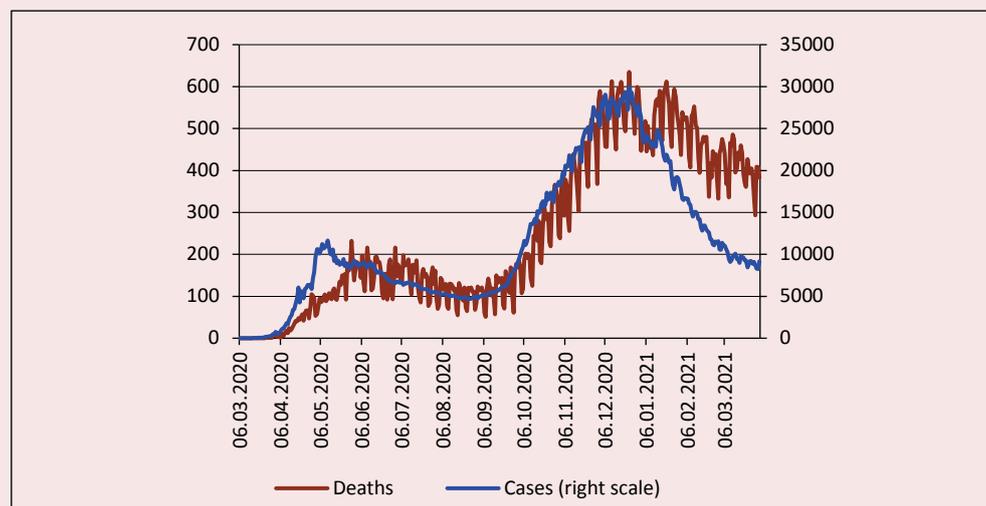
⁴ The course of COVID-19 prevention and control in China can be divided into five stages: 1) from December 27, 2019 to January 19, 2020 – rapid response to COVID-19; 2) from January 20, 2020 to February 20, 2020 – preliminary control over the spread of COVID-19; 3) from February 21, 2020 to March 17, 2020 – daily new COVID-19 cases gradually declined to less than ten; 4) from March 18, 2020 to April 28, 2020 – achievement of decisive results in fighting COVID-19 in Wuhan and Hubei, with a sharp decline in the number of COVID-19 deaths; 5) since April 29, 2020 – regular COVID-19 prevention and control. September 8, 2020, China held a national commendation meeting for the fight against COVID-19 to honor exemplary people who have made an outstanding contribution to this fight. China's President Xi Jinping awarded Mr. Zhong Nanshan the Medal of the Republic in recognition of his significant contribution to the prevention, control, and treatment of COVID-19 in China and around the world.

In the fight against coronavirus, Russia has chosen a strategy of extensive testing for and the earliest possible detection of COVID-19⁵, compulsory monitoring of those who test positive, and a voluntary and advisable transition to remote work. The period of strict quarantine lasted six weeks, after which Russia started to relax the imposed restrictions for the population and business⁶ (Fig. 5).

In general, we can note that the strategy China used to counter the spread of COVID-19 has proven highly effective. The Chinese authorities managed

to suppress the pandemic very quickly and decisively and to prevent its second wave. The more lenient Russian strategy to combat the coronavirus looks less successful in comparison, but in many large countries the situation with the implementation of anti-pandemic policies was even more difficult. Thus, the death rate from COVID-19 in Russia (715 deaths per 1 million inhabitants) was significantly lower than in Italy (1,927), the UK (1,909), the United States (1,762), Brazil (1,675), Spain (1,645), France (1,514), Argentina (1,293) and Germany (960)⁷.

Figure 5. Daily number of COVID-19 cases and deaths in Russia



Source: yandex.ru/covid19.

⁵ Source: Golikova spoke about the Russian strategy to combat coronavirus. *RIA Novosti*. Available at: <https://ria.ru/20201228/strategiya-1591243205.html>

⁶ The chronology of COVID-19 prevention and control in Russia can be divided into six stages: 1) January 24, 2020 – March 5, 2020 – preparatory stage: testing systems to detect coronavirus were developed and their production was launched; operational headquarters to combat COVID-19 were established; the National Plan to prevent the import and spread of coronavirus infection was approved; entry of foreign citizens into the country was restricted; 2) March 6, 2020 – March 24, 2020 – coronavirus infection started spreading: first COVID-19 cases emerged; a ban on mass events was introduced; 3) March 25, 2020 – April 30, 2020 – the stage of strict quarantine: a single six-week period of non-working days was announced; self-isolation regime in the regions was introduced; remote work; shutdown of many enterprises; closure of state and interregional borders; rapid increase in morbidity; first deaths from COVID-19; 4) May 1, 2020 – mid-September 2020 – the restrictions began to be eased gradually against the background of a decline in the daily number of COVID-19 cases; cafes, restaurants, fitness centers, etc. were reopening; air traffic with some countries was resumed; the first COVID-19 vaccine was registered; 5) mid-September – late December 2020 – the second wave of COVID-19 morbidity emerged: infection started spreading rapidly; large-scale vaccination against COVID-19 in the regions began; authorities decided against the imposition of severe restrictions; 6) early January 2021 – present time – decrease in the incidence of COVID-19; mass vaccination of the population; resumption of regular flights with many countries.

⁷ Source: Johns Hopkins Coronavirus Resource Center (data as of April 12, 2021). Available at: <https://coronavirus.jhu.edu>

Literature review

The impact of the COVID-19 pandemic on various economic and social aspects has been widely studied in the scientific literature.

Scenarios of the evolution the pandemic and its implications for macroeconomics [3], financial markets and institutions [4, 5], transnational supply chains [6], foreign investment flows [7], and foreign trade [8] were evaluated on a global scale.

At the national level, the impact of the COVID-19 pandemic on the socio-economic situation in developed and developing countries (for example, the United States [9], Canada [10], Japan [11], Italy, Spain, the UK [12], Israel [13], African countries [14], Latin America [15], Central and South-East Asia [16, 17]) was analyzed. The development of the Russian and Chinese economies in the context of the new coronavirus infection was considered in [18–21]. Scientists performed variant calculations of economic and financial damage, estimated economic dynamics parameters and changes in consumer behavior in connection with the imposed restrictions⁸, substantiated the principles, priorities and vectors of post-crisis economic recovery.

Scientists have considered short- and long-term effects of public health deterioration caused by the COVID-19 pandemic (such as the loss of an opportunity for primary and secondary prevention, sedentary lifestyle, deterioration of general and mental health, etc.) on the functioning of the economy [22]. The factors that contribute to success in the fight against the spread of COVID-19 [23] and reduce its negative impact on economic development are identified⁹.

⁸ See: Guo Xiaobei. The impact of the epidemic on economy and relevant countermeasures. *China Financial and Economic News*, 2020.02.11; Cai Fang. In the long run, the epidemic won't weaken China's economic growth potential. *Front Page of China Daily (Global Edition)*, 2020.02.12; Wang Jianming. The impact of the epidemic on people's consumption behavior pattern and relevant countermeasures. *China Financial and Economic News*, 2020.02.18.

⁹ See: Liu Zhibiao et al. How would COVID-19 being regarded as a public health emergency of international concern affect the Chinese economy? *Nanjing Daily*. 2020.02.05.

Scientific literature pays significant attention to the impact of the COVID-19 pandemic on the industrial sector of the economy, mainly mining [24, 25], machine-building [26, 27], metallurgical [28] and chemical [29] industries, and energy [30]. According to researchers, the major impact on the industry was caused by a sharp drop in demand and a change in its structure, and by the prohibition of traffic and the disruption of supply chains¹⁰.

The areas most affected by the COVID-19 pandemic include the offline areas aimed at personal communication: tourism, transport, accommodation and food provision, healthcare, retail trade, and entertainment. There were reasonable concerns about the decline in access to foodstuffs due to falling incomes, and it is proposed to introduce additional social protection measures [31]. The loss of workforce, the decrease in the productivity and competitiveness of enterprises and the increasing complexity of logistics were named as key issues in agricultural production [32]. Economic implications for the dairy and meat industries, poultry farming and fishing were analyzed [33–35]. Facts are presented, which convincingly prove that the COVID-19 pandemic has challenged the hospitality industry as never before. In particular, the aviation industry has faced the most serious challenge in history. According to the International Air Transport Association, 95% of the world's aircraft fleet has stopped [36]. At the same time, the main burden of the crisis fell on the airline workforce [37]. The volume of railway passenger transportation has significantly decreased [38]. Travel restrictions have led to a sharp reduction in the number of guests, the income of hotels and catering establishments [39]. At the same time, researchers [40] note that the reopening of restaurants and the easing of travel restrictions will not help restore the usual inflow of customers, since

¹⁰ See: Li Qingjuan, Kong Xue. COVID-19 and China's industrial variation trend. *Shanghai Observer*, 2020.02.20. Huang Qifan. Some suggestions for economic development and manufacturing resumption under COVID-19. 2020.02.11.

people no longer feel comfortable in these places. In this regard, in order to minimize contacts between people and increase sustainability in the hospitality industry, it is important to introduce additional safety measures and use various contactless technologies (service robots, contactless payments, digital menus, etc.) [41].

Having analyzed relevant literature sources we find out that the development of the digital economy in the world has become a natural response of business and states to the challenges of the COVID-19 pandemic¹¹. Most public services started to be provided in electronic format. Many companies began to develop Internet projects and launched a wide-scale recruiting of specialists in e-commerce, PR and SMM [42; 43]. The share of households that purchase products via the Internet has significantly increased, and consumers have massively switched to online shopping and delivery services [32]. Internet traffic in those countries that adopted anti-pandemic measures has increased significantly [44]. Remote healthcare (telemedicine¹²) and working from home were no longer considered impracticable, as they were successfully used during the global isolation [45; 46].

Thus, recently, we note an increase in the number of theoretical and empirical studies devoted to the analysis of the impact of the COVID-19 pandemic and the resulting restrictions on the functioning of the economy. Representatives of various countries and economic schools used their own perspective to assess the ongoing changes in production chains and consumption patterns, described the experience of mitigating negative

¹¹ See: Cheng Shi, Gao Xinhong. Long-term impacts of the epidemic: The accelerated evolution of digital economy and the focus of digital economy will be available for the grass-root level. *China Business News*, 2020.02.25; Chen Hongmin. After the epidemic, "Internet +" may usher in the Second Spring. *National Business Daily*, 2020.03.14.

¹² Telemedicine is the use of computer and telecommunications technologies to exchange medical information.

implications for residents and business. At the same time, comparative analysis of these processes in countries with different anti-pandemic strategies has not been given due attention.

Research methodology and data sources

The methodology of our study is based on the principles of system-wide and comparative analysis. We used general scientific methods and research techniques such as induction and deduction, and synthesis of theoretical foundations and empirical experience.

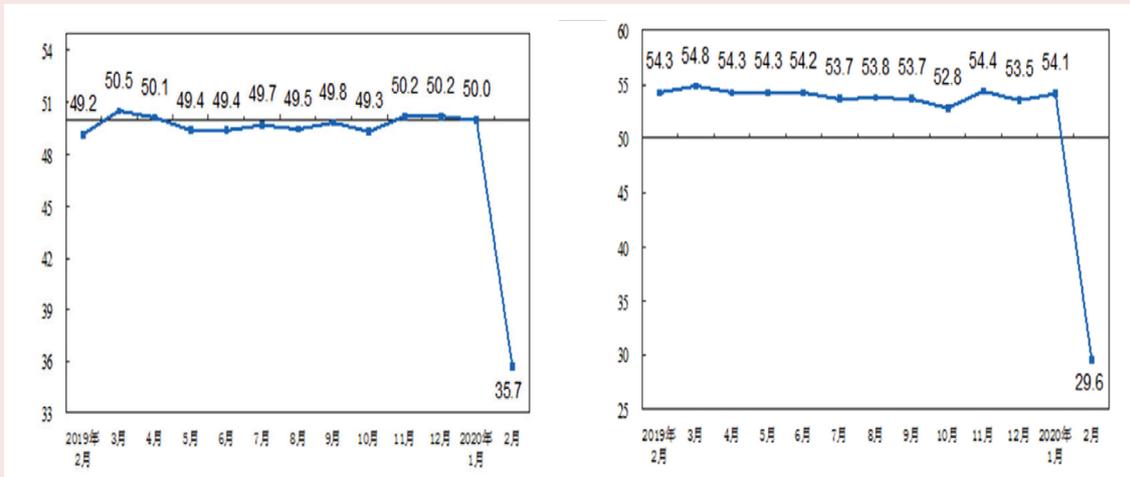
The information base of the study includes data from the World Bank, the Federal State Statistics Service of the Russian Federation, the National Bureau of Statistics of the People's Republic of China, the Ministry of Culture and Tourism of the People's Republic of China, the Ministry of Transport of the People's Republic of China, the Unified Automated Federal Information System on Cinema Viewing Statistics in Russia, the All-Russian Public Opinion Research Center (VTsIOM), the Institute of Research, Haitong Securities, Data Insight, Beijing Maoyan Culture Media, AskCI Consulting, Forward Industry Research Institute.

Research findings

Overall impact of the COVID-19 pandemic on the economies of China and Russia

The extent of the impact of COVID-19 on production depends on the effectiveness of disease prevention and control. According to the National Bureau of Statistics of China, in February 2020, the Manufacturing Purchasing Managers' Index (PMI) and the Non-Manufacturing Purchasing Managers' Index in China were 37.5% and 29.6% respectively; they declined by 14.3 p.p. and 24.5 p.p. respectively from the last month, and the two indices both hit all-time lows, which means that the impacts of COVID-19 on macroeconomy are quite extensive (Fig. 6). Meanwhile, in view of the index decline, the non-manufacturing sector suffered more than the manufacturing sector.

Figure 6. China's Manufacturing PMI and Non-Manufacturing PMI from February 2019 to February 2020 (on a seasonally adjusted basis), %

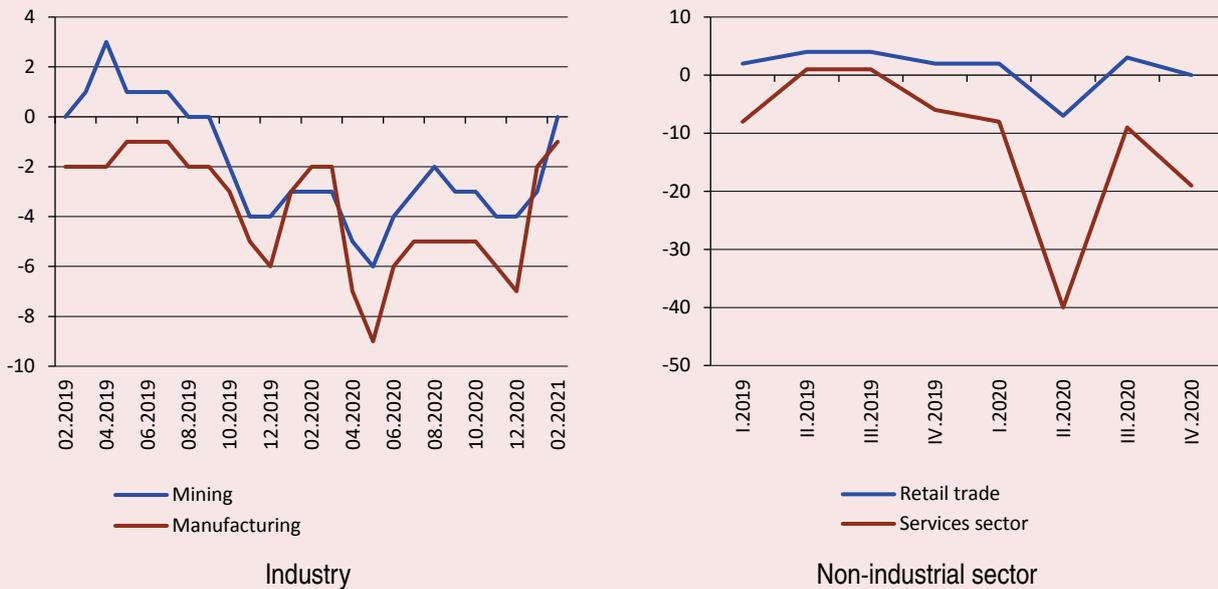


Manufacturing sector

Non-manufacturing sector

Note: 50% indicates that the index is the same as the previous month.
Source: National Bureau of Statistics of China.

Figure 7. Business confidence indices* in the Russian economy in 2019–2020



* The indicator presents an arithmetic mean of the “balance sheets” of the answers of enterprises’ heads to questions about expected output, actual demand, and current balances of finished products (the latter with the opposite sign).
Source: Rosstat.

Business activity in the Russian economy has also been negatively affected by the pandemic. However, the Business Confidence Index (BCI) in industry began to fall since the end of 2019, amid

rising tensions in world trade and the associated decline in prices for Russia’s major export goods. The implementation of restrictive anti-pandemic measures globally and in Russia made the situation

even worse. According to Rosstat, the BCI in Russian mining decreased from -3 to -6 from March to May 2020, and in manufacturing – from -2 to -9. The non-production sphere shows similar, but at the same time more pronounced dynamics of the BCI. Real incomes have been falling since 2014, thus business activity in the consumer sector is being restrained. Due to COVID-19, the BCI in retail trade decreased from 2 in the first quarter of 2020 to -7 in the second quarter, and the BCI in the service sector declined from -8 to -40 (Fig. 7).

In response to the impact of COVID-19, governments of China and Russia have launched measures to support the economy. The Chinese government has launched a policy to ensure stability in employment, financial transactions,

foreign trade, foreign and domestic investment, and consumer expectations (Tab. 2). The state has committed itself to providing jobs, basic necessities of life, the work of market actors, food and energy security, stable industrial and supply chains, the normal functioning of primary-level governments so as to ensure the stable economy and spare no effort to overcome the implications of COVID-19.

The Government of the Russian Federation in April 2020 developed (and subsequently regularly updated) a plan to overcome the economic implications of COVID-19¹³. The plan provided for measures to support the population, business and regions (Tab. 3). A list of the most affected industries¹⁴ was formed, and they received special support. The authorities tried to minimize the

Table 2. Some policies issued by China to respond to COVID-19 since its outbreak

Area	Measures/documents
Healthcare and treatment	Emergency investment of 300 million yuan was allocated from the central budget. In 2020, the central government arranged subsidies for basic public health services and primary-level epidemic prevention and control to a total of 60.33 billion yuan.
Stabilizing prices and ensuring supply	Emergency Notice on Maintaining Normal Production and Marketing Order of Animal Husbandry and Ensuring the Supply of Meat, Egg and Milk Market; Emergency Notice on Further Improving the Agri-businesses Interconnection and Improving the Supply Chain System of Agricultural Products in the Period of Epidemic Prevention and Control; Notice on the Promotion of Typical Practices of Ensuring the Supply of Daily Necessities in the Period of Epidemic Prevention and Control
Tax preferences	Announcement on Tax Policies Related to the Support of COVID-19 Prevention and Control; Notice on Tax Collection and Administration Matters that Support the Resumption of Operation and Production by Individual Businesses; Guidelines on Preferential Tax Policies that Support Epidemic Prevention and Control and Economic and Social Development
Resumption of operation and production	Notice on the Work of Helping Small and Medium Enterprises to Return to Work and Resume Production and Overcoming the Difficulties Together; Emergency Notice on Solving Current Difficulties and Accelerating the Resumption of Operation and Production of Breeding Industry; Notice on Ensuring Foreign Trade and Foreign Investment and Promoting Consumption While Responding to COVID-19; Implementing Opinions on Coordinated Promotion of Epidemic Prevention and Control, Development of Economy and Society, and Transportation
Financial support	Notice on Further Strengthening the Financial Support in the Period of COVID-19 Prevention and Control; Notice on Further Implementing the Periodically Delayed Repayment of Capital and Interest for Loans to Micro, Small, and Medium Enterprises; Guidance on Further Strengthening the Financial Services of Micro, Small, and Medium Enterprises
Providing support to enterprises	Notice on the Proper Handling of Labor Relations in the Period of COVID-19 Prevention and Control; Notice on Strengthening the Cooperation of Financial Service of Industries of Banking and Insurance in Carrying out COVID-19 Prevention and Control; Emergency Notice on Winning the Fight against COVID-19 Prevention and Control and Strengthening the Financial Support of the Key Enterprises that Guarantee the COVID-19 Prevention and Control
Source: own compilation based on publicly available materials.	

¹³ Source: <https://www.economy.gov.ru/material/file/b0c229091827310f12ee94b2d7ee091c/Plan.pdf>

¹⁴ The list includes road transportation, air, water and rail transport, tourism, exhibition activities, hotels, entertainment and leisure, catering, consumer services, culture and sports, non-industrial retail, dental services, additional education, mass media.

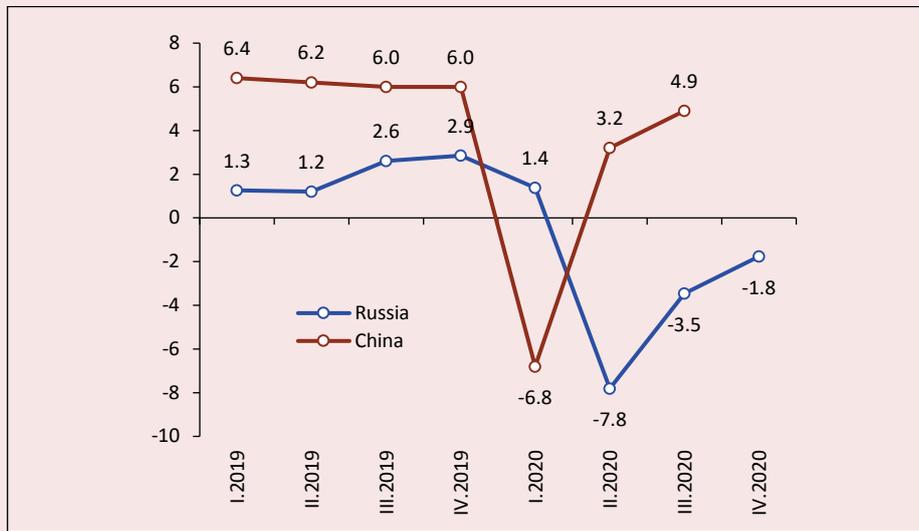
Table 3. Policy of the Government of the Russian Federation to fight COVID-19

Area	Measures
Social support	Allowances for families with children, sick leave for employees over 65 years of age, support for the unemployed, assistance to people with disabilities, support for social workers, support for employees and volunteers, assistance to tourists, extension of the validity of documents, loan repayment holidays, moratorium on the payment of penalties for housing and communal services, monitoring of essential goods, online sales of medicines
Healthcare system mobilization	Providing regions with necessary medical equipment; ensuring adequate bed capacity and bed availability in hospitals; providing hospitals with oxygen; training medical workers; creating rapid COVID-19 tests, as well as test systems for detecting immunity to the virus; developing a vaccine against COVID-19; increasing the production of antiseptics; preparing and constantly updating methodological recommendations for the diagnosis and treatment of acute respiratory viral infection, as well as for the prevention, diagnosis and treatment of new coronavirus infection; providing additional payments to medical workers who are fighting COVID-19; increasing the production, procurement, supplies and stocks of ventilators, medical devices and medicines to combat COVID-19 in the Russian Federation; providing increased insurance guarantees for doctors; developing a system for providing psychological assistance to doctors due to COVID-19; simplified state registration of about 40 types of medical devices; purchasing at least 1.2 thousand ambulances for regions
Measures to support the economy	Moratoriums on bankruptcy and business inspections, loan repayment holidays for businesses, interest-free salary loans, reduced insurance premiums, tax holidays, deferred rent payments, assistance to exporters, gratuitous subsidies, license renewal, support for backbone enterprises, non-refundable loans, support for regions that experience a fall in incomes, support for people's incomes
Changes in the education system	Organizing distance learning for students; developing recommendations for additional education for children; developing an online course on the distance learning process for teachers; providing computer equipment for 234 thousand schoolchildren, mainly from low-income and large families, and for 20 thousand teachers; online submission of documents for enrollment at higher education organizations
Gradual ease of restrictions in regions	Methodological recommendations for the gradual removal of restrictive measures (from the zero to the third stage). Stage zero: almost all the restrictive measures imposed in connection with the spread of COVID-19 are in effect in the region; industrial and construction enterprises and continuously functioning organizations are operating. Stage three: shops and service companies can operate in the region without restrictions on the area and number of visitors; cafes, educational institutions, hotels, as well as parks and squares can open, provided that visitors observe social distancing.
Liability for breaking the COVID-19 lockdown	Administrative and criminal liability for breaking the lockdown (up to seven years of imprisonment). Introduction of lockdown and employee movement permits in several Russia's regions.
Source: own compilation according to the website stopkoronavirus.rf.	

related administrative burden (customs procedures, licensing, certification, public procurement, technical inspections, etc.) and unproductive business costs (moratorium on inspections, cancellation of fines and penalties, postponement of mandatory certifications). Organizations could take advantage of deferred and reduced tax and insurance payments. The moratorium on bankruptcy was introduced so as to protect enterprises from creditors. People's income and employment was protected by providing simplified sick leave, additional allowances for families with children, loan repayment holidays in case of a 30% reduction in income, and interest-free loans to employers to pay wages.

The implementation of these measures made it possible to improve the economic dynamics considerably. Thanks to the effective control of the epidemic, as well as the introduction and implementation of response policies, the economies of Russia and China have shown a V-shaped recovery. In the first quarter of 2020, China's GDP fell by 6.8%, but already in the first three quarters of the year, GDP growth was 0.7% compared to the corresponding period of the previous year (Fig. 8). Russia's GDP, after falling by 8% in the second quarter of 2020 compared to the same period of the previous year, slowed its decline rate to -3.5% in the third quarter of 2020 and to -1.8% in the fourth quarter of 2020.

Figure 8. GDP growth (decline) rate in Russia and China in 2019–2020, in % to the corresponding quarter of the previous year



Source: Rosstat, National Bureau of Statistics of China.

Thus, the governments of both countries managed to respond to the negative impact of restrictive measures in a timely manner and were able to support the economy. China became the only major economy in the world to show positive growth in 2020. In Russia, due to the more complex medical situation regarding the course of the pandemic, the economic recovery was delayed a little longer. It is expected that by the end of 2021, the Russian economy will fully recover from the shocks caused by the COVID-19 pandemic; according to the forecast of the Ministry of Economic Development of the Russian Federation, Russia’s GDP in 2021 will grow by 3.3% under the basic scenario (under the conservative scenario –by 2.7%)¹⁵. As of the end of 2020, Russia’s GDP declined by 3% (for comparison, in the absence of quarantine and other restrictions, GDP fell by 7.8% in 2009, and by 2% in 2015).

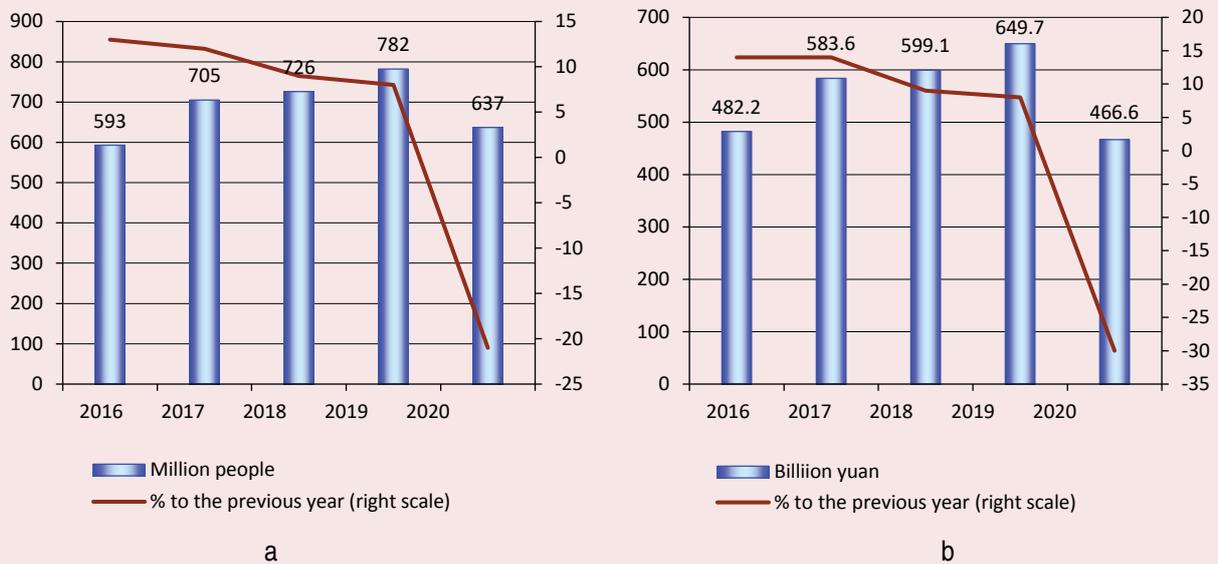
¹⁵ Source: <https://www.economy.gov.ru/material/file/956cde638e96c25da7d978fe3424ad87/Prognoz.pdf>

Impact of COVID-19 on offline areas involving face-to-face interaction

Offline areas focusing on face-to-face interaction (tourism, catering, retail trade, transport, offline entertainment) were the most sensitive to external circumstances and experienced a serious decline.

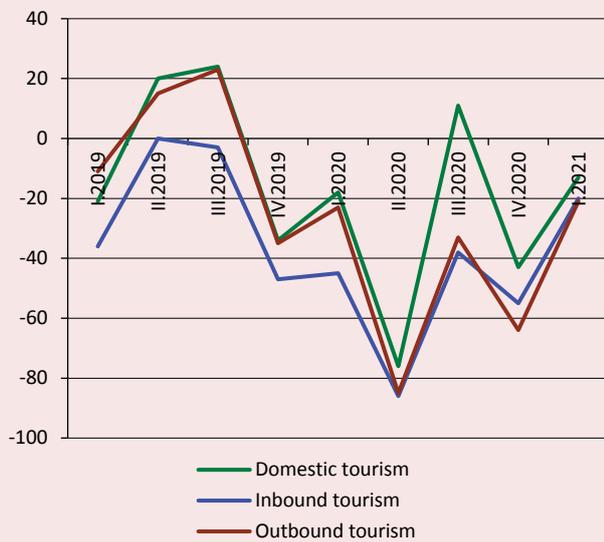
Tourism. A survey of Chinese travel agencies conducted by the Ministry of Culture and Tourism of the People’s Republic of China in early 2020 showed that in the first quarter of 2020, the number of inbound tourists who used the services of Chinese travel agencies decreased by 87.2% compared to the previous year; the number of domestic tourists decreased by 84.1%, and the number of outbound tourists – by 77.7%. By the end of 2020, the tourism sector of the Chinese economy began to recover. During the eight-day celebration of the National Day of the People’s Republic of China (celebrated on October 1), the number of tourists that visited tourist attractions across the country was by 21% less than a year earlier (against the background of

Figure 9. Number of tourists (a) and tourist income (b) on the National Day of the People's Republic of China in 2016–2020



Source: Ministry of Culture and Tourism of the People's Republic of China.

Figure 10. Estimated demand for tourism services in Russia in 2019–2021, balance (difference) of “improvement” and “deterioration” estimates, in p.p.



Source: Rosstat.

Figure 11. Number of inbound and outbound tourist trips in Russia in 2019–2020, as a percentage compared to the corresponding quarter of the previous year



a five-fold drop in tourist traffic at the beginning of the year; Fig. 9a). At the same time, tourist income decreased by 30% (Fig. 9b).

As for Russia, it also experienced a significant decline in business activity in the field of tourism during the period of anti-pandemic restrictions;

the demand for tourist services dropped as well. According to Rosstat, in the second quarter of 2020, the balance of estimates of demand for domestic tourism services (the difference between “improvement” and “deterioration” estimates) collapsed by 76 p.p., for inbound tourism – by 86 p.p., for outbound tourism – by 85 p.p. (*Fig. 10*). As a result, tourist trips stopped almost completely during this period (a 99% drop) (*Fig. 11*). Domestic tourism has become a driving force in the recovery of the tourism industry in the context of the pandemic. In order to support domestic tourism, the Russian government has introduced a tourist cashback program, under which citizens were returned part of their expenses for the purchase of domestic tours and booking tickets. According to the Federal Tourism Agency, about 300 thousand Russians participated in the program in 2020.

Public catering. The drop in the tourist flow was one of the factors causing a serious decline in the field of public catering. According to the National Bureau of Statistics of China, national catering revenue was 602.63 billion yuan in the first quarter of 2020, and it saw a year-over-year decrease of 44.3% compared to the catering revenue of 1.06441 trillion yuan in the first quarter of 2019 (*Tab. 4*). As an offline industry

characterized by people gathering together, the catering industry suffered a “cold winter” in the first quarter of 2020. After the prevention and control of COVID-19 in China achieved serious results, the government began to actively promote the resumption of work, production, business and market; consequently, the catering sector was being gradually restored. In the period from January to September 2020, the rate of decline in the turnover of public catering gradually slowed down. According to the results of nine months of 2020, the decline rate decreased by 23.9% compared to the corresponding period of 2019. Although the catering industry is gradually recovering, a serious downturn still leads to the fact that the growth rate of the national food service market is 16.7 p.p. lower than the dynamics of the entire consumer market in China.

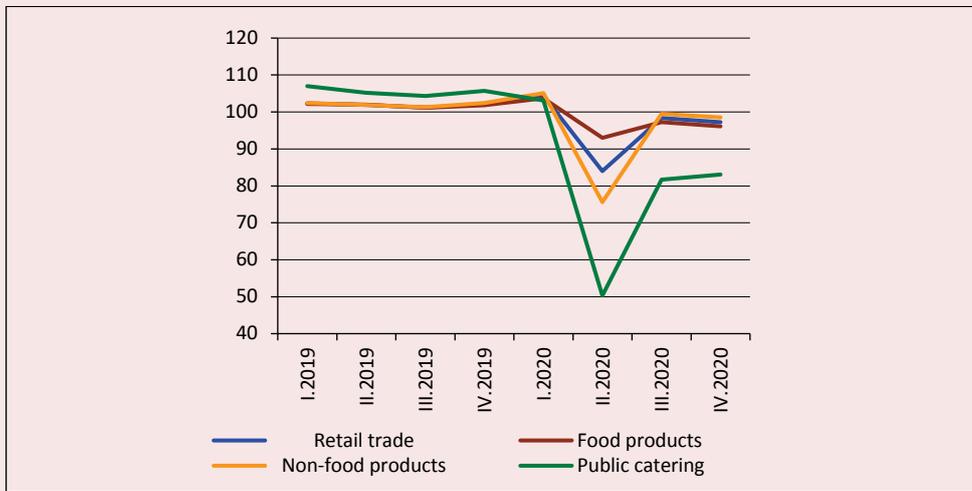
Similar trends are observed in Russia’s public catering sector. The decrease in its turnover in the second quarter of 2020 was 49.7% in comparison with the same period in 2019 (*Fig. 12*). At the same time, the decline in the Russian catering industry was stronger than in Russia’s retail trade as a whole, the volume of which in the period under consideration decreased by 16% (including retail trade in food products – by 7%, in non-food products – by 24.4%).

Table 4. Growth rate (decrease) in the volume of public catering and retail trade in China from January to September 2020, as a percentage compared to the corresponding period of the previous year

Period (2020)	Public catering	Retail sales of consumer goods
Jan.–Feb.	-43.1	-20.5
Jan.–Mar.	-44.3	-19.0
Jan.–Apr.	-41.2	-16.2
Jan.–May	-36.5	-13.5
Jan.–Jun.	-32.8	-11.4
Jan.–Jul.	-29.6	-9.9
Jan.–Aug.	-26.6	-8.6
Jan.–Sept.	-23.9	-7.2

Source: National Bureau of Statistics of China.

Figure 12. Retail trade and public catering turnover in Russia in 2019–2020, as a percentage compared to the corresponding quarter of the previous year

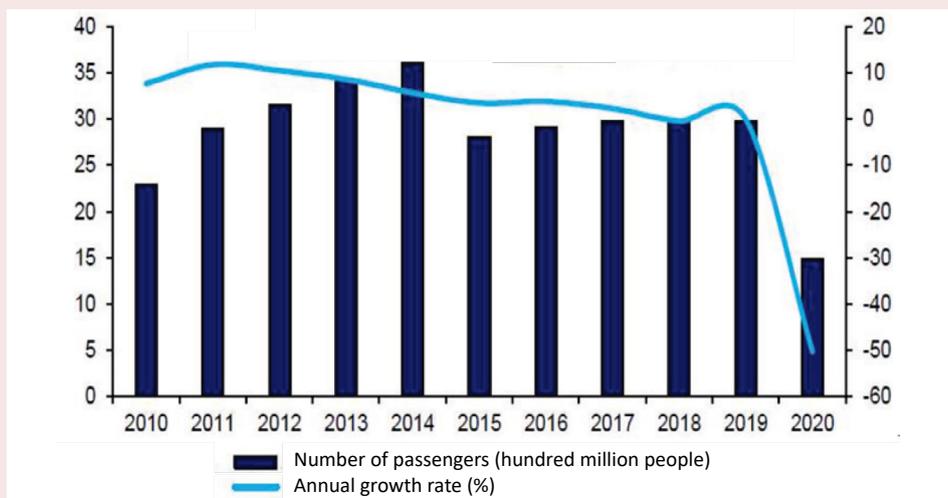


Source: Rosstat.

Transport industry. The Chinese New Year (celebrated in late January – early February) is accompanied by the largest passenger traffic on the planet. According to the Ministry of Transport of the People’s Republic of China, the 40-day Spring

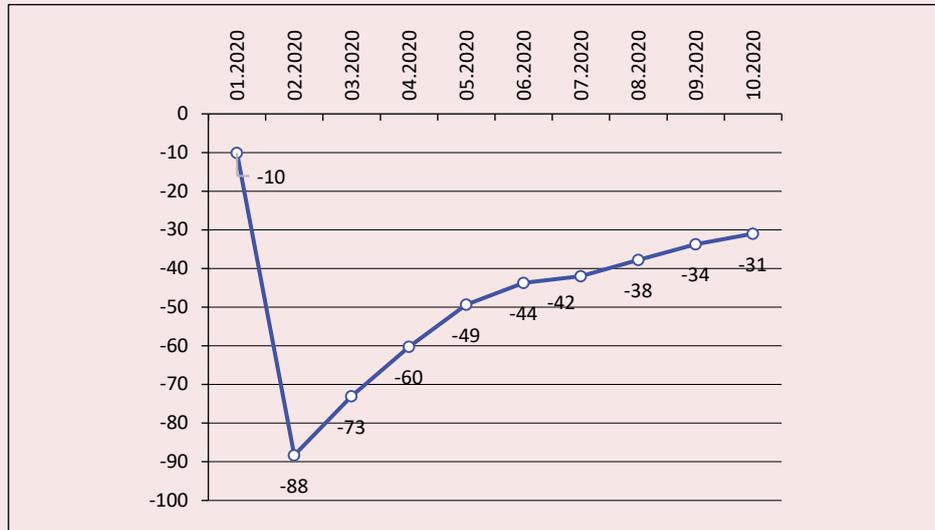
Festival travel rush in 2019 involved 2.98 billion tourists from all over the country. However, due to COVID-19, the 40-day tourist peak of the Spring Festival in 2020 was only 1.48 billion passengers, with a year-on-year decrease of 50.3% (Fig. 13).

Figure 13. Number of passengers (hundred million people) involved in the annual tourist flow during the Annual Spring Festival travel rush, and the year-on-year growth rate (in %)



Source: Ministry of Transport of the People’s Republic of China.

Figure 14. Growth (decline) rate of national commercial passenger traffic in China in 2020, as a percentage compared to the corresponding period of the previous year



Source: Ministry of Transport of the People’s Republic of China.

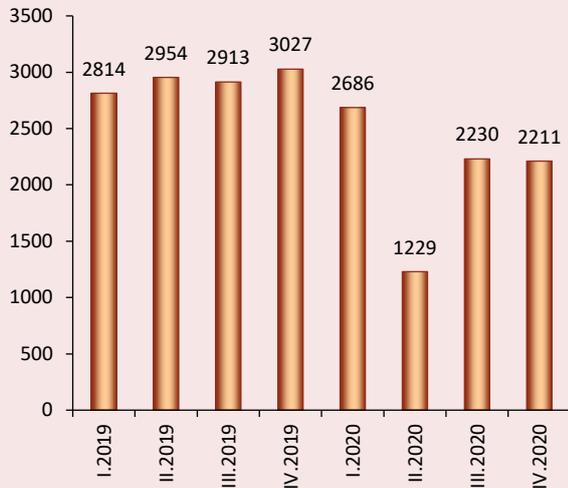
With the improved prevention and control of COVID-19, people’s willingness to go out has gradually recovered. According to the Ministry of Transport of the People’s Republic of China, China’s commercial passenger traffic has been gradually recovering, and in October 2020 it reached almost 70% of the same period of the previous year (Fig. 14).

In the second quarter of 2020, passenger traffic in Russia decreased by 54.2% – from 2.6 to 1.2 billion people. In the following quarters of 2020, passenger traffic began to recover: it increased to 2.2 billion people in the third and fourth quarters. On the whole, by the end of 2020, the volume of passenger transportation has decreased by 28.6%.

Cultural industry. The holidays and Chinese traditional festival, the Spring Festival, is a “golden period” for the Chinese theater industry. However, due to COVID-19, according to Beijing Maoyan

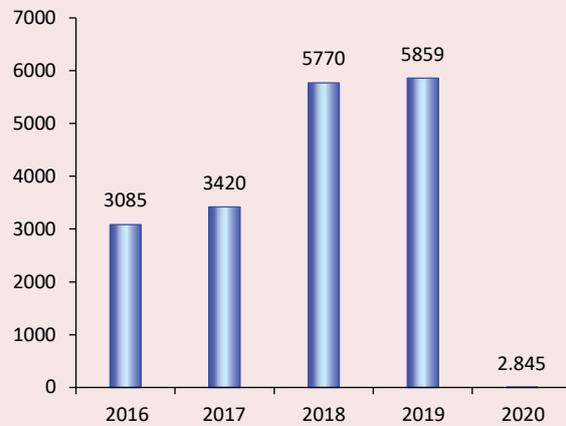
Culture Media Co., Ltd., the national box office revenue on the first day of the Chinese New Year was only 1.81 million yuan, and the national box office revenue during the seven-day celebration of the Spring Festival was only 2.845 million yuan (Fig. 16). In 2019, the box office revenues on the first day of Chinese New Year and during the seven-day Spring Festival holiday were 1.458 billion yuan and 5.859 billion yuan, respectively. As the prevention and control of COVID-19 improved, the industry became dynamic immediately, and the total box office revenue during the eight-day celebration of the National Day of the People’s Republic of China reached nearly 4 billion yuan. As of October 9, the total box office revenue of Chinese movies in 2020 reached 11.991 billion yuan, ranking first in the world. However, this indicator in the same period of 2019 was more than 50 billion yuan, which means COVID-19 still causes a severe setback in the industry.

Figure 15. Passenger transportation in Russia in 2019–2020, million people



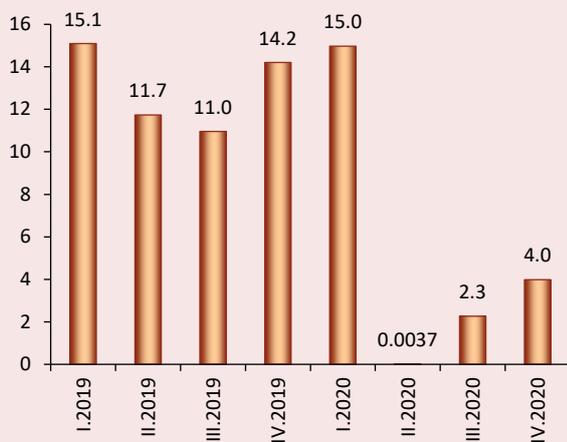
Source: Rosstat.

Figure 16. Box office receipts during the celebration of the Spring Festival in China in 2016–2020, million yuan



Source: Beijing Maoyan Culture Media Co., Ltd. and AskCI Consulting Co., Ltd.

Figure 17. Box office receipts of cinemas in Russia in 2019–2020, billion rubles



Source: Unified Automated Information System on Cinema Viewing Statistics.

The telling example of the negative impact of anti-pandemic restrictions on the cultural sphere in Russia is the dynamics of cinema attendance. Box office receipts in the second quarter of 2020 fell to almost zero, amounting to 3.7 million rubles, compared to 15 billion rubles in the previous quarter (Fig. 17). At the same time, the audience is in no

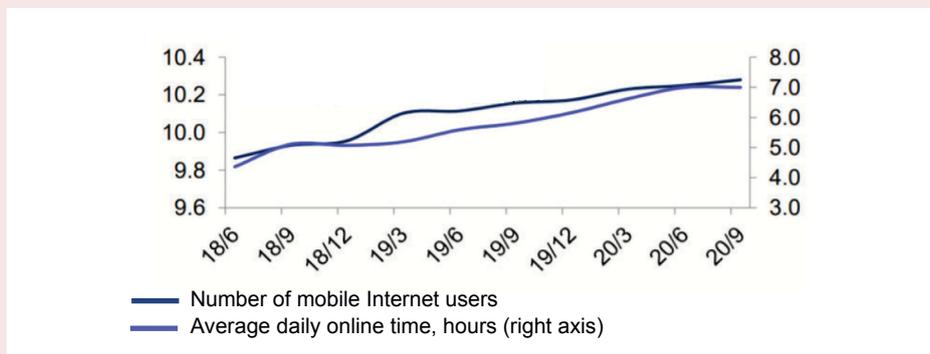
hurry to start attending the cinemas; by the end of 2020, box office receipts increased only to four billion rubles (28% of the level of the corresponding period in 2019).

Impact of COVID-19 on online industries involving human-computer interaction

Online industries that involve human-computer interaction mainly include e-commerce/new retail, online video, online games, online education, remote work, and other areas. In 2020, due to the demand for COVID-19 prevention and control, the online economy grew rapidly as the daily consumption habits and working style of residents changed significantly.

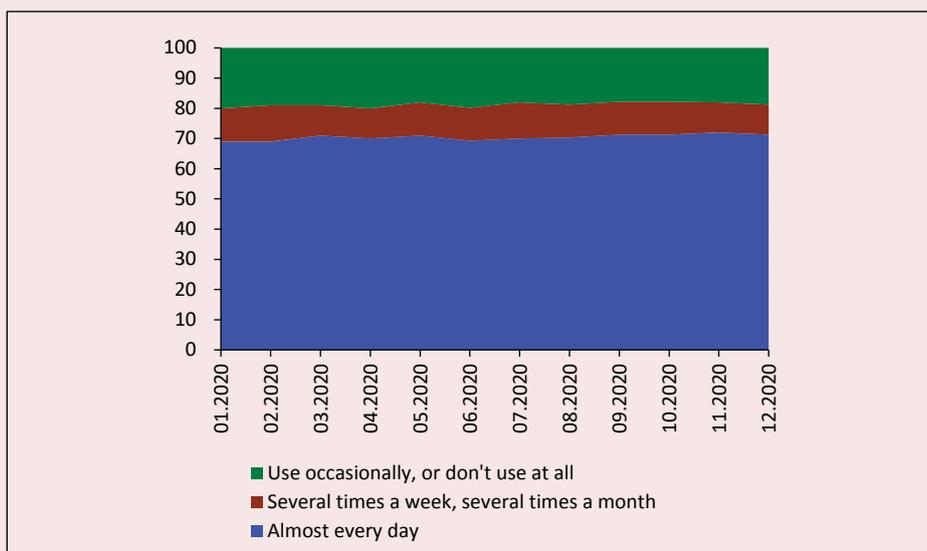
Internet activity. In recent years, the number of Internet users (including mobile Internet users) and the average daily time spent online steadily increased worldwide. Since 2020, the growth rate has been more pronounced due to COVID-19 (Fig. 18, 19). In China, the number of mobile Internet users has exceeded 1 billion people. In Russia, the share of those who use the Internet almost every day has increased to 72%, according to VTsIOM.

Figure 18. Number of mobile Internet users in China and the average daily online time in 2018–2020



Source: Institute of Research, Haitong Securities.

Figure 19. Distribution of answers to the question “Do you use the Internet, and if so, how often?” in Russia, as a percentage of the total



Source: VTsIOM daily All-Russian telephone survey.

Online trading and express delivery. The COVID-19 pandemic has changed people’s shopping and consumption habits, and the online retail industry, as well as related industries, has begun to develop rapidly. Since 2020, China has accelerated the development of new consumption styles, and online retail businesses such as

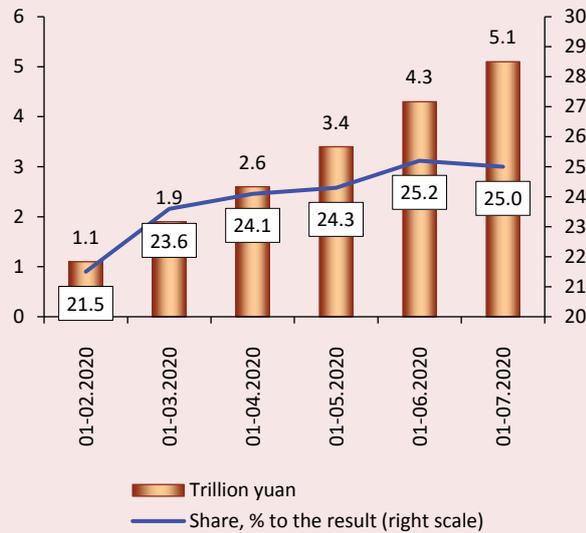
e-commerce of fresh foodstuffs and their delivery to the buyer’s home have grown steadily and rapidly. From January to July, online retail sales of physical goods increased by 15.7% year-on-year (*Tab. 5; Fig. 20*) and accounted for 25% of the total retail sales of consumer goods (a year earlier, their share was 19.4%; *Fig. 21*).

Table 5. Growth (decline) rate in the volume of online retail sales of physical goods in China from January to October 2020, % to the corresponding period of the previous year

Period (2020)	Online retail sales of physical goods	Retail sales of consumer goods
Jan.–Feb.	3.0	-20.5
Jan.–Mar.	5.9	-19.0
Jan.–Apr.	8.6	-16.2
Jan.–May	11.5	-13.5
Jan.–Jun.	14.3	-11.4
Jan.–Jul.	15.7	-9.9
Jan.–Aug.	15.8	-8.6
Jan.–Sept.	15.3	-7.2
Jan.–Oct.	16.0	–

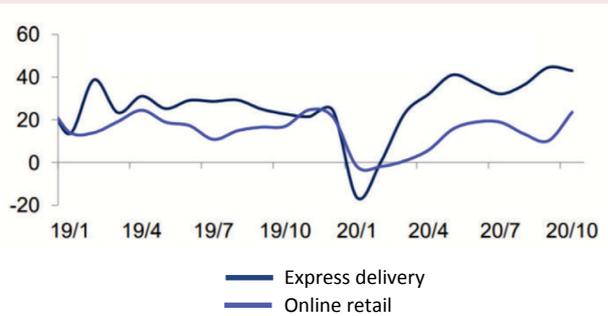
Source: National Bureau of Statistics of China.

Figure 20. Volume of online retail sales of physical goods and its share in the total volume of retail sales of consumer goods in China



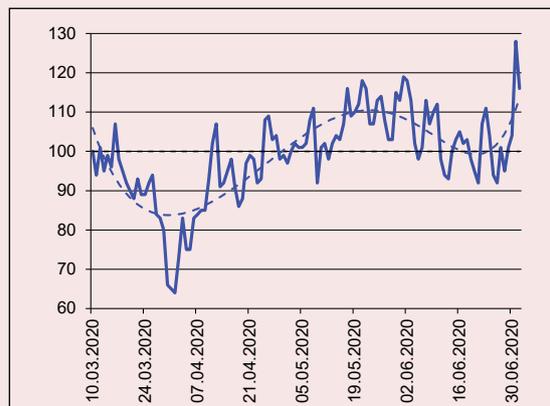
Sources: National Bureau of Statistics of China.

Figure 21. Dynamics of the development of express delivery and online retail in China in 2019–2020, %



Source: Institute of Research, Haitong Securities.

Figure 22. Data Insight E-Commerce Index in Russia



The level of February 25 – March 2, 2020 is taken as 100%

Source: Data Insight.

Due to the impact of coronavirus-related restrictions on the retail market, online shopping in Russia skyrocketed in the first half of 2020. According to Data Insight, the March–June 2020 E-Commerce Index has increased by almost a third (Fig. 22). Its share in the total retail sales reached 10.9% in the first half of 2020 (it was 6.1% in 2019)¹⁶.

¹⁶ Source: <https://www.rbc.ru/rbcfreenews/5f592c909a79471b55995534>

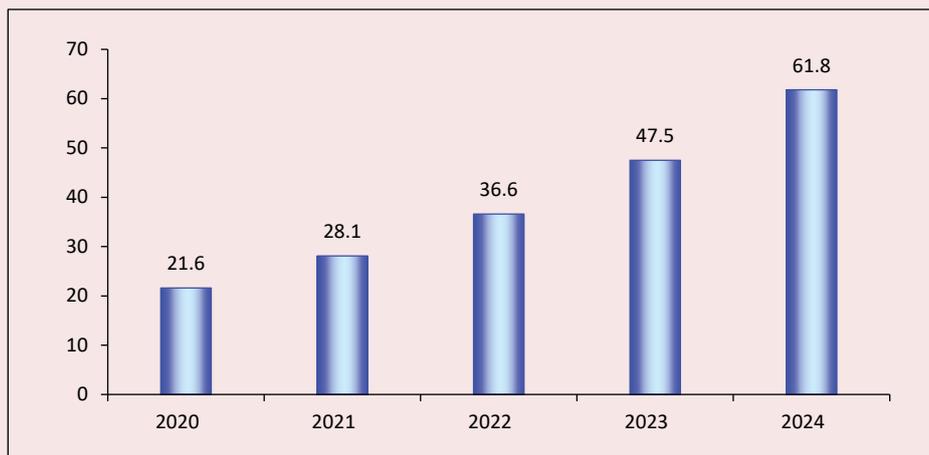
Remote working. The COVID-19 pandemic is gradually changing the way people produce and work, thereby contributing to the development of remote working and related industries. Since February 3, 2020, due to COVID-19, many companies in China have had to opt for remote work. The data showed that from February 3 to February 9, the first week after the Spring Festival, more than 18 million companies adopted remote work, and more than 300 million people used teleworking software. In the post-epidemic era, remote work has become a common thing, and it will drive rapid development of remote personnel management software.

According to VTsIOM, the share of Russians who work remotely has increased eight-fold during the stay-at-home restrictions imposed due to the coronavirus: before the pandemic, only 2% of respondents worked remotely, and 16% have already switched to it in full or in part¹⁷. One third of Russians did not experience any changes in their employment regime in connection with the pandemic.

Telemedicine. The COVID-19 pandemic has gradually changed the way people access healthcare and has pushed for the development of the field of telemedicine. In China, during COVID-19 in 2020, with the help of 5G technology, all the “cloud” medical services of Chinese telemedicine (registration, consultation, diagnosis, prescription, dispensing) reached a new level, providing people with a new medical experience (*Fig. 23*). In the future, we should expect growth in the size of the telemedicine market.

In general, the scale of economic impact of the pandemic and the extent of economic shock are closely related to the effectiveness of prevention and control of the spread of COVID-19 and to the policies implemented to support people and businesses. The COVID-19 pandemic has had the greatest negative impact on offline industries that involve face-to-face interaction. The consumer sector (catering, retail, tourism, and transportation) received the first blow and experienced a downturn. At the same time, COVID-19 has contributed to the development of online spheres involving human-

Figure 23. Anticipated size of China's telemedicine market in 2020–2025, billion yuan



Source: Forward Industry Research Institute.

¹⁷ Source: <https://tass.ru/ekonomika/8478435>

computer interaction. Changes in consumer behavior and habits have boosted modernization of many industries. Due to the widespread application of modern information technology, consumers began to use the Internet more actively; this accelerated the development of online retail: e-commerce in foodstuffs, express logistics and other new types of business (online entertainment, online education, remote work, telemedicine).

Suggestions

1. COVID-19 prevention and strict control. People's lives and safety should be a priority. COVID-19 prevention and control activities should be carried out comprehensively and effectively. It is important to monitor the spread of the virus, respond to it in a timely and effective manner, and focus on preventing the risk of COVID-19 importation from abroad. Prevention should be accompanied by simple things such as washing hands regularly, maintaining personal hygiene, and wearing masks. It is necessary to understand COVID-19 spreading patterns, use the working mechanism of joint prevention and control to the fullest extent, continue working on comprehensive screening, and create a reliable mechanism for preventing health emergencies in the long run.

2. Supporting domestic demand. It is necessary to reveal the potential for increasing domestic demand, promote the growth of people's incomes, and promote the diversified and differentiated development of industries by upgrading consumption.

3. Promoting the transformation and modernization of traditional industries. In order to help traditional industries adapt to the major changes in consumer demands, it is necessary to increase the supply of healthy, green, safe and convenient products and services; to promote digitalization, intellectual transformation and modernization of industries, including housing construction, catering, tourism, transport, etc.; to accelerate the promotion and application of modern information technology in agriculture, manufacturing, services and other sectors; to accelerate the development of online and offline integration.

4. Promoting intensive development of new industries, new business forms and production modes. It is necessary to adapt to business reform trends and upgrades in consumer behavior, to collect resources and implement policies to further support the development of the Internet+ industry, to encourage widespread use of 5G networks, artificial intelligence, big data, blockchain and other technologies in business, culture, tourism, education, medicine and other areas, and to build a new business form for the service sector.

5. Increasing the country's role in global supply chains. We find it important to integrate domestic and international markets and improve the system of interaction between industrial chains, capital chains, talent chains, political and service chains in global supply chain networks.

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PUBLIC OPINION MONITORING

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. The monitoring is conducted by VoIRC RAS in the Vologda Oblast ¹.

The following tables and graphs show the dynamics of several parameters of social well-being and socio-political sentiment of the region's population according to the results of the latest "wave" of the monitoring (October 2021) and for the period from December 2020 to October 2021 (the latest six polls, that is, almost a year).

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 2018–2020².

In August – October 2021, the level of approval of the RF President's work did not change significantly. The share of positive assessments is 52%. The proportion of negative assessments is 33%.

Over the past six surveys (December 2020 – October 2021) the assessment of the head of state's activity has not changed: the share of positive judgments is 52%, negative – 33%³.

The level of approval of the work of the Chairman of the RF Government in October 2021 was 38–39%, just as in December 2020.

From December 2020 to October 2021, assessments of the work of the region's head improved significantly: the share of positive judgements increased by 5 p.p. (from 33 to 38%), the share of negative assessments decreased by 3 p.p. (from 44 to 41%).

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 VoIRC RAS polls is available at <http://www.vscs.ac.ru/>.

² In 2020, four "waves" of the monitoring were conducted. Surveys in April and June 2020 were not conducted due to quarantine restrictions during the spread of COVID-19.

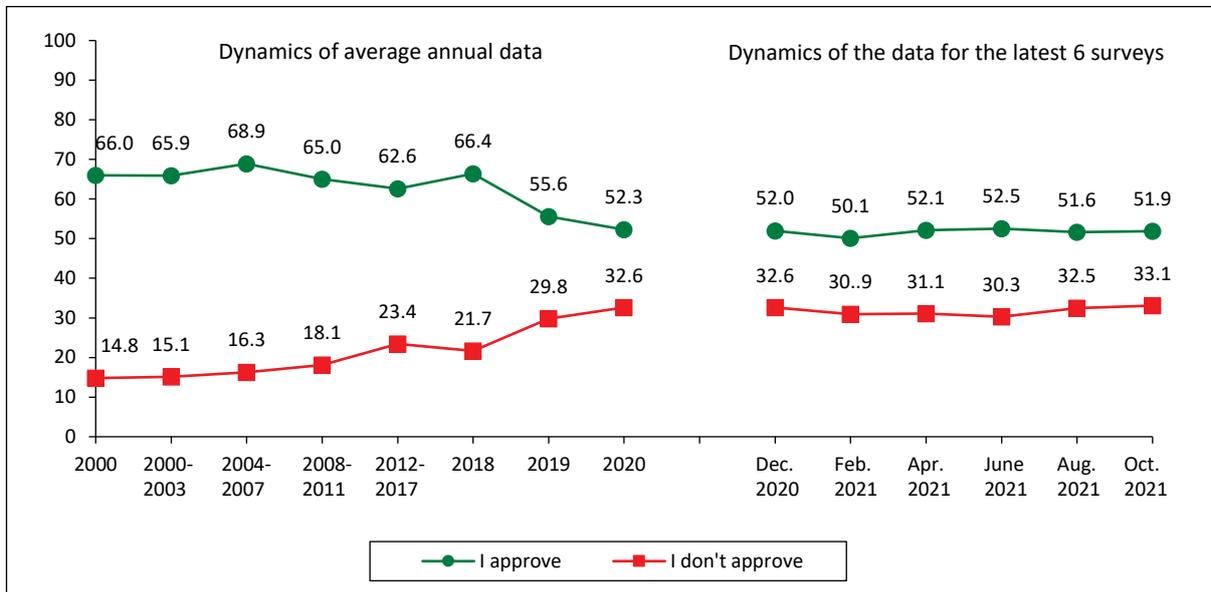
³ Hereinafter, the results of a comparative analysis of the data from the survey conducted in August 2021, and the results of a last-year monitoring "wave", conducted in October 2020 (the last survey before pandemic restrictions), are given in the frame.

How do you assess the current performance of..? (% of respondents)*

Respond option	Dynamics of average annual data							Dynamics of the data for the latest 6 surveys						Dynamics (+/-), Oct. 2021 to Dec. 2020
	2000	2007	2011	2012	2018	2019	2020	Dec. 2020	Feb. 2021	Apr. 2021	June 2021	Aug. 2021	Oct. 2021	
RF President														
I approve	66.0	75.3	58.7	51.7	66.4	55.6	52.3	52.0	50.1	52.1	52.5	51.6	51.9	0
I disapprove	14.8	11.5	25.5	32.6	21.7	29.8	32.6	32.6	30.9	31.1	30.3	32.5	33.1	+1
Chairman of the RF Government*														
I approve	-*	-*	59.3	49.6	48.0	41.1	38.7	39.1	37.6	38.8	42.2	42.7	39.7	+1
I disapprove	-	-	24.7	33.3	31.6	38.4	40.4	38.8	38.8	38.3	35.1	36.0	38.3	-1
Governor														
I approve	56.1	55.8	45.7	41.9	38.4	35.7	35.0	32.9	33.9	36.3	37.8	38.6	37.5	+5
I disapprove	19.3	22.2	30.5	33.3	37.6	40.2	42.5	44.2	42.4	41.3	38.4	38.5	40.7	-4

The wording of the question: "How do you assess the current performance of ...?" According to the survey technique, sampling error does not exceed 3%, so hereinafter changes with a difference of 2 p.p. are not taken into account or are considered insignificant; they are highlighted in blue in the tables. Positive changes are highlighted in green, negative changes are highlighted in red.
*Included in the survey since 2008.

How do you assess the current performance of the RF President? (% of respondents, VoIRC RAS data)



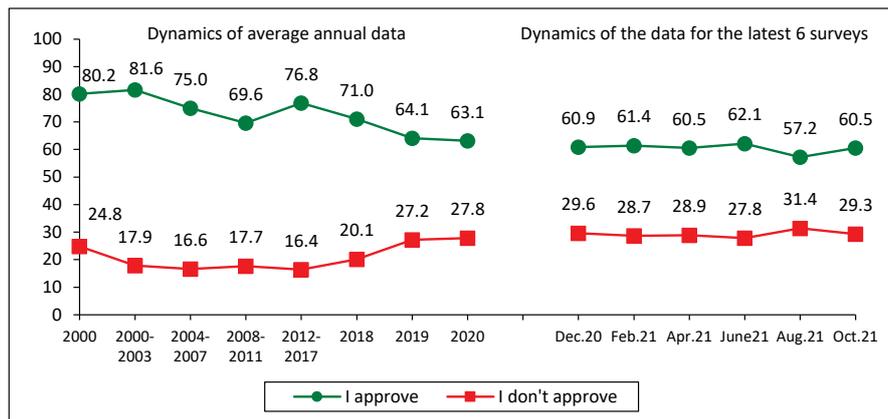
Hereinafter, all graphs show the average annual data for 2000, 2018, 2019, 2020, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017, corresponding to the periods of presidential terms.

For reference:

According to VTsIOM, the level of approval of the RF President's work for the period from August to the 1st half of October 2021 increased by 4 p.p. (from 57 to 61%).

According to the latest data from Levada-Center (as of September 2021) we can see positive changes in the dynamics of assessments of the work of the head of state: the share of positive assessments increased by 3 p.p. (from 61 to 64%) compared to August 2021.*

In general, do you approve or disapprove of the work of the RF President?
(% of respondents; VTsIOM data)



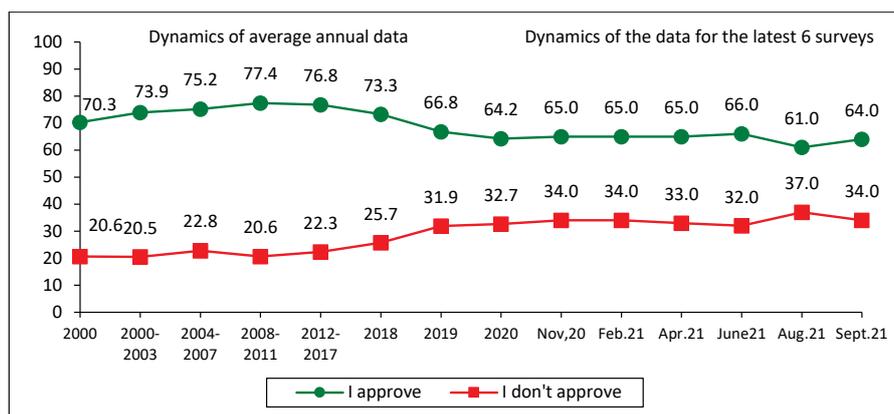
Annual dynamics (October 2021 to December 2020)	
Respond option	Dynamics (+ / -)
I approve	0
I disapprove	0

Question: "In general, do you approve or disapprove of the work of the President of the Russian Federation?"

Data for October 2021 – average value for two surveys: conducted on October 3, 2021 and October 10, 2021.

Source: VTsIOM 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 (September 2021 to November 2020)	
Respond option	Dynamics (+ / -)
I approve	-1
I disapprove	0

Question: "In general, do you approve or disapprove of the work of Vladimir Putin at the position of the President of Russia?"

Source: Levada-Center*. Indicators. Available at: <https://www.levada.ru/indikatory>. The latest data – July 2021.

Source: Levada-Center* data. Available at: <https://www.levada.ru/> (no data for December 2020).

* Included in the register of foreign agents.

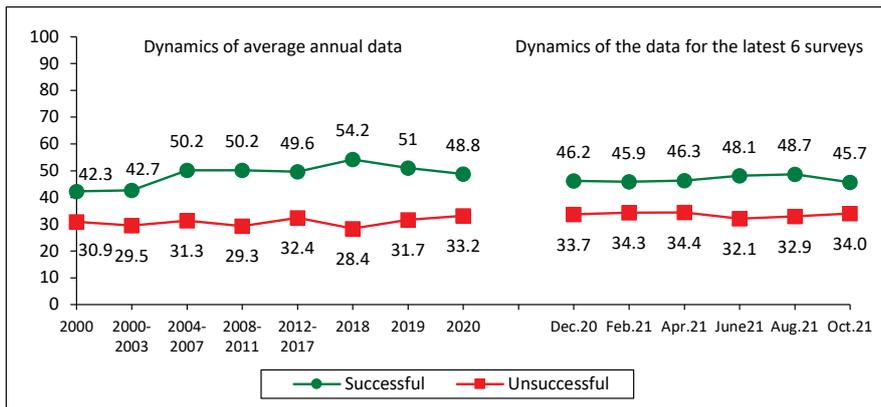
Over the past two months, there was a slight deterioration in the public opinion concerning the RF President’s work on strengthening Russia’s international positions (the share of positive assessments decreased by 3 p.p., from 49 to 46%) and on his efforts to promote economic recovery and growth of citizens’ welfare (the proportion of negative judgments increased by 2 p.p., from 61 to 63%).

As in August, in October 2021, 42–43% of Vologda Oblast residents note that V.V. Putin is successfully coping with the task of restoring order in the country; 35% consider the activities of the head of state to protect democracy and strengthen citizens’ freedoms to be successful.

From October 2020 to August 2021, the share of positive assessments of the work of the RF President aimed at restoring order in the country increased slightly (by 2–3 p.p.) (from 41 to 43%), to protecting democracy (from 32 to 35%), boosting the economy (from 25 to 27%)

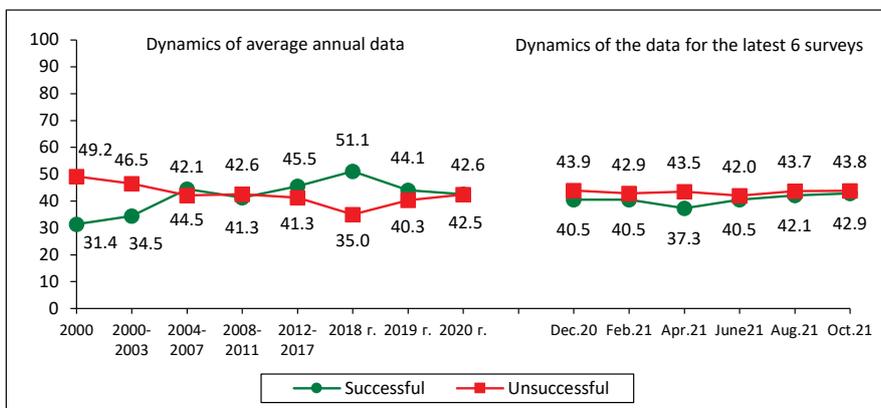
In your opinion, how successful is the RF President in coping with challenging issues?
(% of respondents; VoIRC RAS data)

Strengthening Russia’s international position



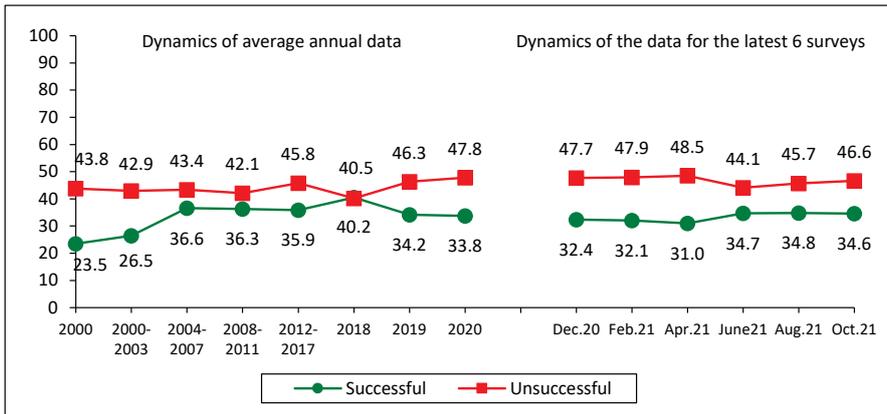
Respond option	Dynamics (+ / -)
Successful	-1
Unsuccessful	0

Imposing order in the country



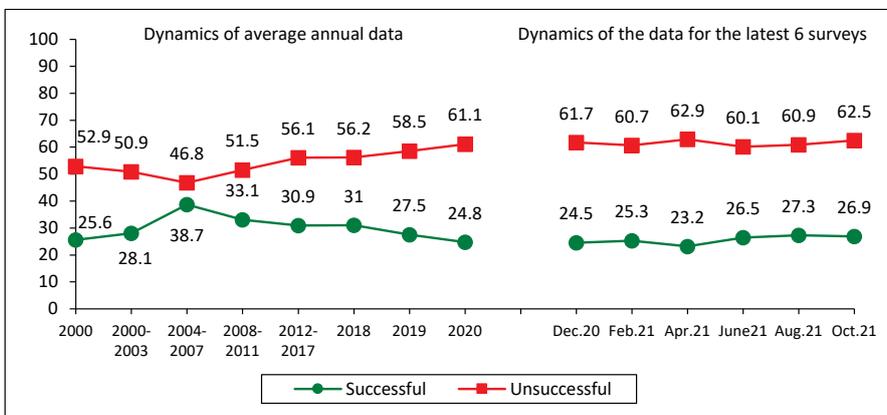
Respond option	Dynamics (+ / -)
Successful	+2
Unsuccessful	0

Protecting democracy and strengthening citizens' freedoms



Annual dynamics (October 2021 to December 2020)	
Respond option	Dynamics (+ / -)
Successful	+2
Unsuccessful	-1

Economic recovery and increase in citizens' welfare



Annual dynamics (October 2021 to December 2020)	
Respond option	Dynamics (+ / -)
Successful	+2
Unsuccessful	+1

There have been no significant changes in the structure of political preferences of the region’s residents for the period from August to October 2021: the level of support for United Russia is 32–33%, KPRF and LDPR – 9–11% each, “Just Russia – For the Truth” – 5–6%.

At the same time, over the past two months, the proportion of people who have not decided on their political preferences, or who believe that none of the political forces currently represented in the State Duma reflects their interests has significantly decreased (by 6 p.p., from 44 to 38%).

During the period from December 2020 to October 2021, there was a slight increase in the share of supporters of United Russia (by 2 p.p., from 31 to 33%) and KPRF (by 4 p.p., from 7 to 11%).

Which party expresses your interests? (% of respondents; VoIRC RAS data)

Party	Dynamics of average annual data										Data dynamics for the last 6 polls						Dynamics (+/-), Oct. 2021 to Dec. 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	Dec. 2020	Feb. 2021	Apr. 2021	June 2021	Aug. 2021	Oct. 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	30.5	31.5	32.1	31.7	32.7	+2
KPRF	11.5	7.0	10.3	16.8	10.6	8.3	14.2	9.2	8.8	8.4	7.3	8.3	8.7	8.1	9.3	11.1	+4
LDPR	4.8	7.5	7.8	15.4	7.8	10.4	21.9	9.6	9.1	9.5	9.5	10.1	9.9	8.5	9.9	11.2	+2
Just Russia – for the Truth	-	7.8	5.6	27.2	6.6	4.2	10.8	2.9	3.4	4.7	5.0	3.6	2.6	4.1	5.3	6.3	+1
Other	0.9	1.8	1.9	-	2.1	0.3	-	0.7	0.3	0.5	0.7	0.2	0.1	0.1	0.2	0.5	0
None	29.6	17.8	29.4	-	31.3	29.4	-	28.5	33.7	34.2	35.3	35.9	36.4	35.4	34.1	31.7	-4
I find it difficult to answer	20.3	21.2	13.2	-	11.7	12.0	-	11.2	11.0	11.1	11.2	11.3	10.9	11.8	9.6	6.6	-4

In October 2021, the upward trend in the assessments of public sentiment continued. Over the past two months, the share of people experiencing mostly positive emotions increased from 68 to 71% (by 3 p.p.); the proportion of those who believe that “everything is not so bad and it is possible to live, it is difficult to live, but it is possible to stand it” did not change significantly (77%).

The share of people who positively characterize their mood and have a high potential for patience is higher than in October 2020 (by 11 and 7 p.p., respectively).

The share of the Oblast residents who subjectively classify themselves as “poor and extremely poor” increased slightly over the past two months (by 2 p.p., from 48 to 50%); the share of people of “average income” decreased from 41 to 39%.

In general, the structure of social self-identification in October 2021 corresponds to the level of six months ago (December 2020): the proportion of “the poor and extremely poor” still prevails over the proportion of those with “average income” by 10 p.p.

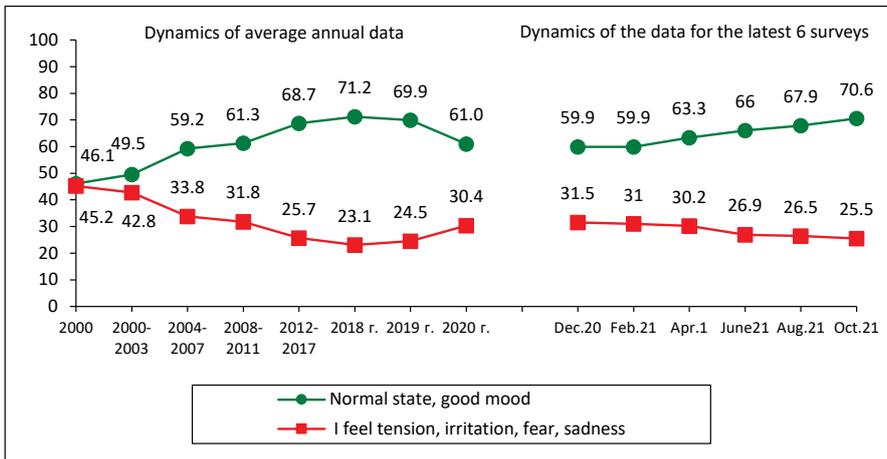
In August – October 2021, there was an increase in the consumer sentiment index (by 3 points, from 83 to 86 p.), which indicates a slight increase in people’s optimistic moods about the dynamics of the economic situation in the country and their personal financial situation.

The CSI is still below 100 points (which means the predominance of pessimistic forecasts in the Oblast in general); however, we should note that positive changes are observed for the first time in the past six months. Compared to December 2020, in October 2021, the consumer sentiment index increased by 3 points (from 83 to 86 p.).

For reference: according to the latest data from Levada-Center* (included in the register of foreign agents), the consumer sentiment index in the whole country did not change in June – August 2021 (75 p.); for the period from September 2020 to August 2021, it increased by 2 points (from 73 to 75 p.)

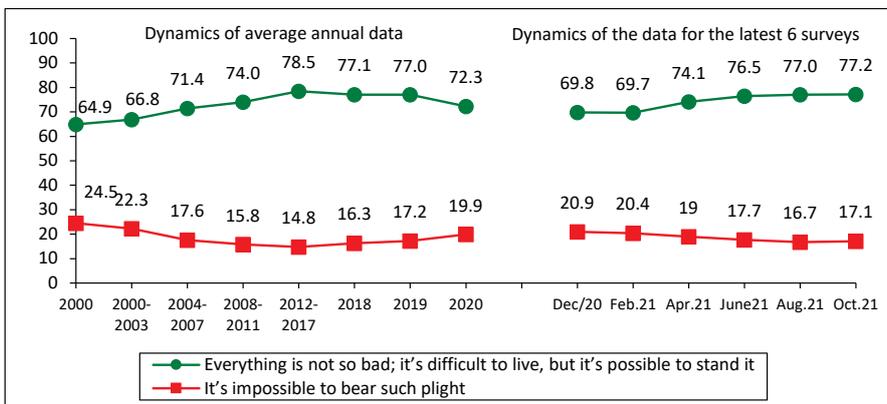
Estimation of social condition (% of respondents; VoIRC RAS data)

Social mood



Annual dynamics (October 2021 to December 2020)	
Respond option	Dynamics (+ / -)
Usual condition, good mood	+11
I feel stress, irritation, fear, sadness	-6

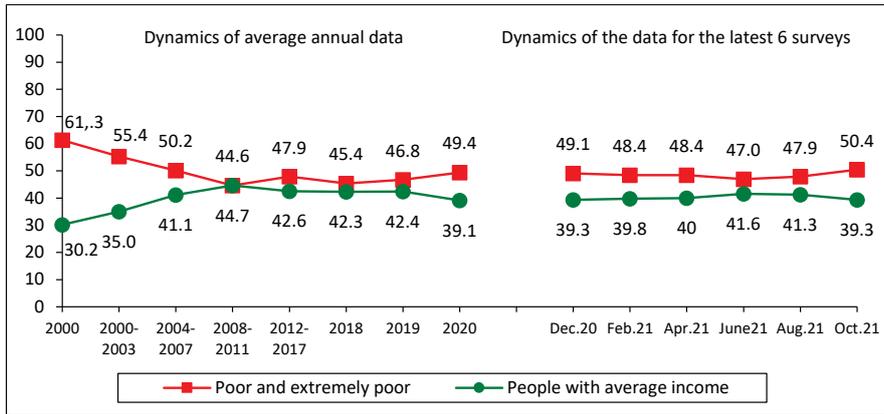
Stock of patience



Annual dynamics (October 2021 to December 2020)	
Respond option	Dynamics (+ / -)
Everything is not so bad; it's difficult to live, but it's possible to stand it	+7
It's impossible to bear such plight	-4

* Included in the register of foreign agents.

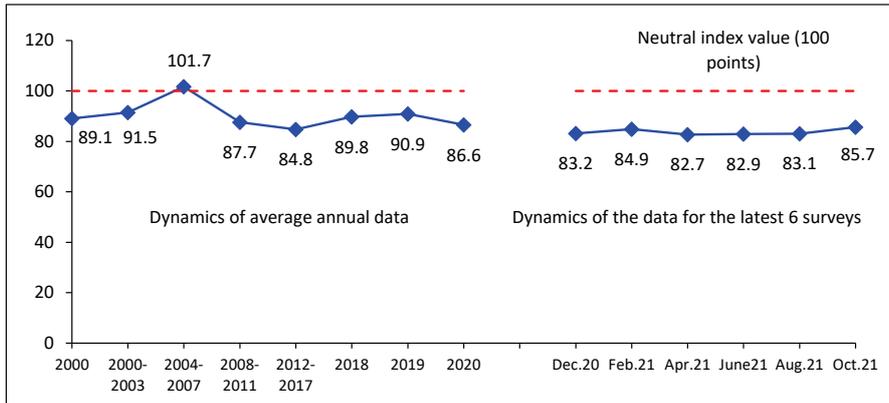
Social self-identification*



Annual dynamics (October 2021 to December 2020)	
Respond option	Dynamics (+ / -)
People with average income	0
Poor and extremely poor	+1

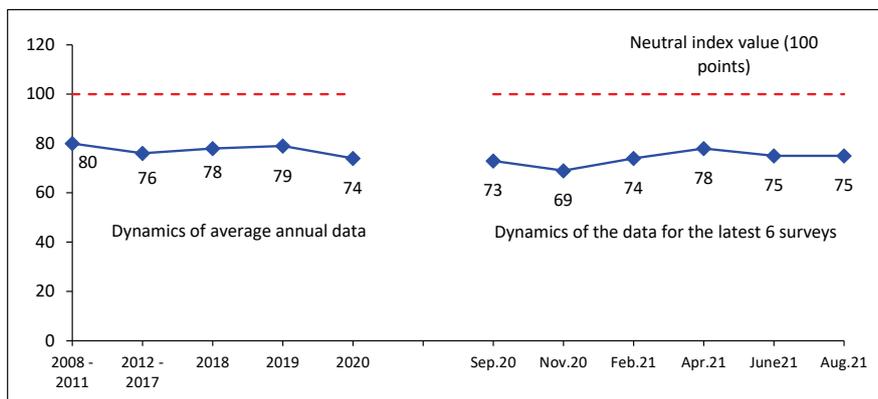
Question: "Which category do You belong to, in your opinion?"

Consumer Sentiment Index (CSI, points; data of VolRC RAS for the Vologda Oblast)



Annual dynamics (October 2021 to December 2020)	
CSI	Dynamics (+ / -)
Index value, points	+3

Consumer Sentiment Index (CSI; Levada-Center* data for Russia)



Annual dynamics (August 2021 to September 2020)	
CSI	Dynamics (+ / -)
Index value, points	+2

The index is calculated since 2008.

Latest data is for June 2021. There are no data for the period from April to August 2020.

Source: Levada-Center* data. Available at: <https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/>

* Included in the register of foreign agents.

Over the past two months, the share of people who positively characterize their daily mood has increased in 6 out of 14 socio-demographic groups, especially among people over the age of 60 (by 10 p.p., from 58 to 68%), as well as among those who, according to self-estimates of their own income, belong to the category of 20% of the least affluent residents of the Oblast (by 5 p.p., from 55 to 60%).

Negative changes in the dynamics of social mood assessments are noted among people under the age of 30 (by 7 p.p., from 82 to 75%), as well as in the group of 20% of the wealthiest residents of the region (by 3 p.p., from 87 to 84%).

For the period from December 2020 to October 2021, positive changes in social mood are observed in all major socio-demographic groups, especially among people who, according to self-estimates of their income, belong to the bottom 20% (by 21 p.p., from 39 to 60%).

Social mood in different social groups (respond option "Wonderful mood, normal, stable condition", % of respondents; VoIRC RAS data)

Population group	Dynamics of average annual data							Dynamics of the data for the latest 6 surveys						Dynamics (+/-), Oct. 2021 to Dec. 2020
	2000	2007	2011	2012	2018	2019	2020	Dec. 2020	Feb. 2021	Apr. 2021	June 2021	Aug. 2021	Oct. 2021	
Sex														
Men	50.1	65.9	64.5	69.1	72.8	70.1	60.8	60.0	60.8	61.3	65.1	65.6	70.0	+10
Women	43.3	61.7	62.0	65.8	69.8	69.6	61.2	59.8	59.2	64.9	66.7	69.8	70.9	+11
Age														
Under 30	59.1	71.3	70.0	72.3	80.0	81.1	67.6	65.2	60.9	67.4	73.0	82.3	75.3	+10
30–55	44.2	64.8	62.5	67.9	72.6	71.2	61.8	60.9	64.4	65.5	70.0	71.4	70.8	+10
Over 55	37.4	54.8	58.3	62.1	65.2	63.3	57.4	56.5	54.1	59.1	58.3	58.1	68.3	+12
Education														
Secondary and incomplete secondary	41.7	58.4	57.4	57.2	64.8	63.2	56.1	52.6	56.2	56.9	62.5	63.2	64.1	+12
Secondary vocational	46.4	64.6	63.6	66.7	72.2	72.7	63.5	62.5	60.9	64.3	66.1	68.5	70.4	+8
Higher and incomplete higher	53.3	68.6	68.3	77.0	76.8	73.4	63.3	64.6	62.7	68.7	69.7	73.0	77.1	+13
Income groups														
Bottom 20%	28.4	51.6	45.3	51.5	57.3	53.2	43.4	38.9	44.3	49.8	54.2	55.0	60.4	+21
Middle 60%	45.5	62.9	65.3	68.7	71.9	71.4	62.6	63.3	60.1	65.8	67.0	68.9	70.9	+8
Top 20%	64.6	74.9	75.3	81.1	82.9	81.8	75.6	76.3	76.0	70.8	76.5	86.7	84.2	+8
Territories														
Vologda	49.2	63.1	67.1	73.6	71.0	68.6	60.9	58.7	55.8	57.0	59.4	59.7	64.0	+6
Cherepovets	50.8	68.1	71.2	76.2	75.8	71.2	60.4	60.7	64.4	68.1	70.8	72.3	75.2	+15
Districts	42.2	61.6	57.1	59.8	68.7	69.8	61.4	60.0	59.7	64.0	67.1	70.1	71.5	+12
Oblast	46.2	63.6	63.1	67.3	71.2	69.9	61.0	59.9	59.9	63.3	66.0	67.9	70.5	+11

CONCLUSIONS

The results of the next “wave” of public opinion monitoring conducted in October 2021 indicate several largely contradictory trends.

On the one hand, support for the work of the authorities remains stable. The share of positive assessments concerning the work of the RF President has remained at the level of 50–52% over the past 6 polls. There are also no significant changes in the assessments of V.V. Putin’s work on addressing Russia’s key problems (with the exception of a slight decrease, in October 2021, in the proportion of people who believe that the RF President is successfully coping with strengthening Russia’s international positions (by 3 p.p., from 49 to 46%))

The structure of people’s political preferences as a whole reflects the results of the elections to the State Duma held on September 17–19, 2021. We observe:

- ✓ a stable share of supporters of the United Russia party (31–33% in the last 6 polls);
- ✓ over the same period (from December 2020 to October 2021) – the growth of support for the Communist Party (by 4 p.p., from 7 to 11%);
- ✓ a noticeable decrease in the proportion of citizens who have not made up their mind yet or who believe that none of the main political parties reflects their interests. Over the past two months, their share decreased by 6 p.p. (from 44 to 38%), over the last 6 surveys – by 8 p.p. (from 46 to 38%).

Since February 2021, the proportion of residents of the Oblast who characterize their mood as “normal, excellent” has been steadily growing. Over the past two months, their share increased by 3 p.p. (from 68 to 71%), in general, for the period from February to October 2021 – by 11 p.p. (from 60 to 71%).

At the same time, it is important to note that over the past two months, the share of positive assessments of social mood in the Oblast as a whole has increased primarily due to assessments of socially vulnerable groups – people over 60 years of age and low-income groups. This, in our opinion, suggests that the social orientation of the state (which can be traced in the public speeches of the president, in the amendments to the Constitution he proposed, and in the measures of financial support for citizens regularly taken by the RF Government) is reflected in the assessments of public opinion. The question is whether the authorities will be able to maintain this positive trend.

Another important positive change for the period from August to October 2021 was, in our opinion, an increase in the consumer sentiment index (by 3 points, from 83 to 86 p.), which indicates an improvement in the forecasts of the population regarding the prospects for the development of the Russian economy and their personal financial situation. The increase in the consumer sentiment index is still extremely insignificant; perhaps it will not become a trend; in addition, it should be noted that the CSI still remains in the zone below 100 p., which indicates the predominance of pessimistic expectations among the people. And, nevertheless, taking into account the dynamics of the previous months (in which no positive changes have been observed for a long time), the growth of the CSI by 3 p.p. compared to the previous “wave” of surveys is a rather significant and indicative result; in our opinion, it is closely related to the already noted long-term trend of improving social sentiment.

Thus, according to the results of sociological surveys (those conducted not only in the Vologda Oblast, but also nationwide), positive changes or, at least, the absence of negative ones are noted according to many very significant criteria for evaluating the effectiveness of public administration. During the period of the State Duma election, as well as against the background of the ongoing threat of the COVID-19 pandemic, this, of course, can be regarded as an achievement of the authorities at all levels and the head of state himself.

However, at the same time, judging by the dynamics of public sentiment, there is no tangible progress in solving the most pressing, lingering problems. Here, first of all, we are talking about people's subjective perception of the dynamics of the standard of living and quality of life. According to the results of the latest survey, the proportion of people subjectively classifying themselves as "poor and extremely poor" (which has long prevailed over the proportion of "middle-income" people) has increased by 2 p.p. over the past two months (from 48 to 50%) and, thus, exceeded the annual average for the period since 2008.

At the same time, we see that negative trends in assessing the Russian President's work aimed at promoting economic recovery and the growth of citizens' welfare: over the past three surveys (from June to October 2021), the share of negative judgments increased by 3 p.p. (from 60 to 63%), and over the past 3 years (from 2018 to 2020) – by 5 p.p. (from 56 to 61%).

Thus, while we observe favorable long-term trends and short-term changes in the dynamics of social well-being, in the change in consumer sentiment, and amid the absence of any signs of deterioration in the assessments of the work of the authorities, there still remains an alarming situation regarding overcoming the problem of poverty (or rather, people's subjective perception of the dynamics of the standard of living and quality of life), which V.V. Putin called "our main enemy" and "a threat to stable development, to the demographic future"⁴.

In fact, this assessment is the most comprehensive reflection of the state of the entire public administration system: on the one hand, recognition of its still insufficient effectiveness in solving the most pressing problems of concern to the population, on the other hand, awareness of the need for its system-wide and comprehensive adjustment. In particular, in order to justify the "credit of trust" given to Vladimir Putin in the presidential election of 2018 and to the United Russia, the party of power, in the parliamentary election of 2021; or, in other words, so as not to lose the existing legitimacy of the implemented political course in the assessments of public opinion.

Materials were prepared by M.V. Morev, E.E. Leonidova, I.M. Bakhvalova

⁴ Vladimir Putin's speech at a meeting with deputies of the State Duma of the eighth convocation. *Official Website of the RF President*. October 12, 2021. Available at: <http://www.kremlin.ru/events/president/transcripts/66905>

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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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