FEDERAL STATE BUDGETARY INSTITUTION OF SCIENCE
VOLOGDA RESEARCH CENTER OF THE RUSSIAN ACADEMY OF SCIENCES

ECONOMIC AND SOCIAL CHANGES:

FACTS, TRENDS, FORECAST

Volume 15, Issue 4, 2022

The journal was founded in 2008

Publication frequency: bimonthly

According to the Decision of the Ministry of Education and Science of the Russian Federation, the journal *Economic and Social Changes: Facts, Trends, Forecast* is on the List of peer-reviewed scientific journals and editions that are authorized to publish principal research findings of doctoral (candidate's) dissertations in scientific specialties:
08.00.00 – economic sciences;
22.00.00 – sociological sciences.

The journal is included in the following abstract and full text databases:
Web of Science (ESCI),
ProQuest,
EBSCOhost,
Directory of Open Access Journals (DOAJ),
RePEc,
Ulrich's Periodicals Directory,
VINITI RAS,
Russian Science Citation Index (RSCI).

The journal's issues are sent to the U.S. Library of Congress and to the German National Library of Economics.

All research articles submitted to the journal are subject to mandatory peer-review.
Opinions presented in the articles can differ from those of the editor. Authors of the articles are responsible for the material selected and stated.

ISSN 2307-0331 (Print)
ISSN 2312-9824 (Online)

Internet address: **http://esc.volnc.ru**

ECONOMIC AND SOCIAL CHANGES: FACTS, TRENDS, FORECAST

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

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

Founder: Vologda Research Center of the Russian Academy of Sciences

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

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

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

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

MAIN RESEARCH DIRECTIONS

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

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

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

INTERNATIONAL TIES AND PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CONTENT

EDITORIAL

PUBLIC ADMINISTRATION

THEORETICAL AND METHODOLOGICAL ISSUES

REGIONAL ECONOMICS

PUBLIC FINANCE

ENVIRONMENTAL ECONOMICS

SCIENCE, TECHNOLOGY AND INNOVATION STUDIES

SOCIAL AND ECONOMIC DEVELOPMENT

FOREIGN EXPERIENCE

SCIENTIFIC REVIEWS

MONITORING OF PUBLIC OPINION

EDITORIAL

DOI: 10.15838/esc.2022.4.82.1
UDC 354, LBC 66.03

On the Way toward Crossing the Inner Rubicon

Vladimir A
ILYIN
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
E-mail: ilin@vscc.ac.ru
ORCID: 0000-0003-4536-6287; ResearcherID: N-4615-2017

Mikhail V.
MOREV
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
E-mail: 379post@mail.ru
ORCID: 0000-0003-1396-8195; ResearcherID: I-9815-2016

Abstract. February 24, 2022, the President of the Russian Federation announced the beginning of a special military operation on the territory of Ukraine; this, in fact, became a Rubicon in the 30-year history of Russia's existence within the framework of the liberal-democratic development paradigm imposed by the Collective West. Six months have passed since the launch of the operation. During this period, Russian society has faced unprecedented sanctions pressure from the United States and NATO and the withdrawal of a significant number of large foreign companies from the Russian market; the situation in Ukraine continues to arouse significant concerns. Sociological surveys indicate that the majority of Russian citizens support the President and the goals of the special operation. However, representatives of different social strata react differently to the events taking place in internal and external political and economic life. The article analyzes trends in social sentiment and the level of approval of the President's work on the basis of long-term monitoring of public opinion conducted by VolRC RAS in the territory of the Vologda Oblast. We conclude that the broad strata of Russian society feel the effect of the

For citation: Ilyin V.A., Morev M.V. (2022). On the way toward crossing the inner Rubicon. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 9–31. DOI: 10.15838/esc.2022.4.82.1

measures taken by the RF President and the RF Government to mitigate the effects of sanctions pressure on the economy and the quality of life and improve the spiritual, moral and cultural atmosphere that corresponds to the goals of national development in the current geopolitical situation; the attitude toward the measures is reflected in the assessments of public opinion. Besides, relying on expert assessments and statistical data, we dwell upon the problem of whether the views of individual representatives of Russia's ruling circles and financial and cultural elites correspond to the RF President's goals to "build and strengthen Russia as a strong sovereign power", whose sovereignty "cannot be segmented or fragmented in the 21st century" as Vladimir Putin noted at the Saint Petersburg International Economic Forum on June 17, 2022. That is, sovereignty must be complete, not only political, economic or military, but, first of all, spiritual, cultural and moral. To achieve the set goals of national development, it is necessary to change the elites in the system of public administration, economy and culture. It is necessary to move from the elite, which was formed during the period of the country's life in the framework of the liberal-capitalist paradigm before the special operation, to the elites that ensure the sovereign development of Russia based on traditional spiritual and moral values and social justice.

Key words: special operation, civilizational conflict, spiritual sovereignty, RF President, social sentiment, ruling circles.

February 24, 2022, after announcing the start of a special military operation on the territory of Ukraine, Russia crossed the Rubicon in its relations with the Collective West by launching an open and irreversible process of moving away from the "semi-colonial" existence that has taken place over the past 30 years since the collapse of the Soviet Union, toward achieving full national sovereignty.

"We are acting to defend ourselves from the threats created for us... The purpose of this operation is to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime. To this end, we will seek to demilitarise and denazify Ukraine, as well as bring to trial those who perpetrated numerous bloody crimes against civilians, including against citizens of the Russian Federation"[1].

"...The 1990s, Yeltsinism, were times of Russia as a semi-colony without any "crypto", and we must, albeit with difficulty and blood, even by military means, get out of this historical trap"[2].

"**What is Full State Sovereignty?** It consists of five sovereignties:

1. Recognition of the country's territory, flag, coat of arms and anthem by the international community.
2. Diplomatic sovereignty – the ability to pursue an independent international policy...
3. Military sovereignty.
4. Economic sovereignty.
5. Cultural sovereignty. **As our history has shown, it is the most important component of sovereignty. With his absence, the path to nowhere begins"**[3].

[1] Address of the President of the Russian Federation to the citizens of Russia on February 24, 2022. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67843

[2] Fursov A. What Hitler failed to achieve, the Anglo-Saxons are trying to achieve today. The Izborsk Club. April 29, 2022. Available at: https://izborsk-club.ru/22708

[3] Starikov N.V. The shortage of state sovereignty. Official website of N. Starikov. July 28, 2010. Available at: https://nstarikov.ru/defitsit-gosudarstvennogo-suverenite-6047

According to experts, today Russia is undergoing a "test for steady development"[4], during which not only its military and economic, but also its patriotic, cultural, spiritual and moral potential is being tested. This, first of all, concerns the ruling strata, whose representatives, as history shows, become the main reason for the collapse of the state: if the state does not pass this "test", then "one common reason underlies the collapse – the inability of political elites to ensure stable development ..." when "the accumulation of wealth begins to displace virtue and service to the state as the main indicator of success"[5].

The six months that have passed since the beginning of the special military operation on the territory of Ukraine have shown that the economic blitzkrieg organized by NATO countries led by the United States failed, which the President of the Russian Federation stated on June 17 at the Saint Petersburg International Economic Forum.

"The idea was clear as day – they expected to suddenly and violently crush the Russian economy, to hit Russia's industry, finance, and people's living standards by destroying business chains, forcibly recalling Western companies from the Russian market, and freezing Russian assets. This did not work. Obviously, it did not work out; it did not happen.... As for the blitzkrieg they have tried against our economy, it is clear that it did not work out... The same is true of the blitzkrieg against Russia"[6].

After the meeting of the leaders of Russia, Iran and Turkey in Tehran on July 19, 2022, periodicals of the Western media came out with the headlines "The West **helplessly** watches Russia create a new world order" (Handelsblatt, Germany), "Tehran and Putin create an **anti-NATO** axis" (Corriere della Sera, Italy), "Vladimir Putin creates a new alliance of rogue states that will pose **a more serious threat to the West than the old Soviet bloc**" (Daily Mail, UK).

Russia continued to strengthen international relations with those states that refused to support NATO countries in their anti-Russian policy; thus the RF is creating new economic and political foundations for its own development. "The West has failed to put together a global anti-Russian front. Most countries of the world did not support the Russophobic policy. The sanctions are not supported by China, India, Brazil, the leading countries of Africa, the Arab world, and Latin America"[7].

The goals of the special military operation are being systematically implemented, and initially the main principle that guided the Supreme Commander-in-Chief was "people and their lives"[8]. This principle applies not only directly to military personnel, **but also to the preservation of the habitual way of life of the civilian population.** According to experts, "normal life" is an "absolute goal"; therefore, the President and the government promptly take the necessary measures to reduce the negative impact of economic sanctions and to

[4] Arbatova N. Twenty centuries of the rise and decline of empires. *Nezavisimaya gazeta*. July 13, 2022. Available at: https://www.ng.ru/ideas/2022-07-13/7_8485_empires.htmll

[5] Ibidem.

[6] Vladimir Putin's speech at the plenary session of the Saint Petersburg International Economic Forum on June 17, 2022. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/68669

[7] Pushkov: The West failed to put together a global anti-Russian front. Federal News Agency. July 27, 2022. Available at: https://riafan.ru/23559481-pushkov_zapadu_ne_udalos_skolotit_global_nii_antirossiiskii_front

[8] Vladimir Putin's speech at the meeting with the heads of the constituent entities of the Federation on April 28, 2020. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/63288

ensure that "people living in Russia continue to live as they do".

> "A person living in Russia is told the following: **You can and should continue to live the way you live, and it is our duty to provide you with such an opportunity...** We will try to minimize the losses of our professional army. And even more so, we will try to take out of harm's way that part of the population that does not sign a professional contract and does not voluntarily assume all the costs arising from this contract. This part of the population should not be disturbed in any way at all... **normal life is an absolute goal. And our political system is implementing this goal"**[9].

One of the main points in Vladimir Putin's public speeches that he voiced throughout virtually all his presidential terms was the thesis that "The opinion of people, our citizens as the bearers of sovereignty and the main source of power must be decisive"[10]. In this sense, the dynamics of public sentiment indicate that the task of maintaining a way of life familiar to citizens is being fulfilled.

Table 1. The attitude of Russians toward the work of the RF President in February – August 2022 (VCIOM data), % of respondents

People's assessments	20 Feb. 2022	21 Aug. 2022	Dynamics (+/-)
Share of positive assessments	64.3	78.4	+14
Share of negative assessments	24.4	12.6	-12

Source: Rating assessing the activities of state institutions. VCIOM. Available at: https://wciom.ru/ratings/dejatelnost-gosudarstvennykh-institutov/

Thus, according to VCIOM, since the beginning of the special military operation, the level of approval of the President's work has increased by 14 percentage points (from 64 to 78%; *Tab. 1*), the share of negative assessments has decreased by 12 percentage points (from 24 to 12%).

The overwhelming majority of Russians (65–70%) have shown and are showing support for the special operation. At the same time, the proportion of those who support the special operation increased by 7 percentage points from February to June 2022 (from 65 to 72%; *Tab. 2*), and the share of those who hold the opposite opinion decreased by 8 percentage points (from 25 to 17%).

In order to understand the trends observed in public sentiment after the start of the special military operation, we analyzed the data of the monitoring of public opinion conducted by Vologda Research Center of the Russian Academy of Sciences (VolRC RAS)[11] for the period from February to August 2022 in comparison with the same period of 2021.

Table 2. The attitude of Russians toward the special operation on the territory of Ukraine (VCIOM data), % of respondents

People's assessments	25 Feb. 2022	25 June 2022	Dynamics (+/-)
Share of those who support the operation	65	72	+7
Share of those who don't support the operation	25	17	-8

Source: VCIOM analytical review "Special Military Operation: Monitoring". VCIOM official website. June 30, 2022. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/specialnaja-voennaja-operacija-monitoring-20223006

[9] Kurginyan S. In order not to fall into the abyss. *Zavtra*. June 29, 2022. Available at: https://zavtra.ru/blogs/chtobi_ne_ruhnut_v_bezdnu

[10] Address of the President to the Federal Assembly of the Russian Federation on January 15, 2020. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/62582

[11] The public opinion monitoring has been conducted since 1996 on the territory of the Vologda Oblast. Surveys are conducted every two months (with the exception of missing monitoring "waves" in April and June 2020 due to quarantine restrictions imposed on the territory of the region in order to prevent the spread of COVID-19); 1,500 respondents over the age of 18 are interviewed in the cities of Vologda and Cherepovets, in Babaevsky, Velikoustyugsky, Vozhegodsky, Gryazovetsky, Kirillovsky, Nikolsky, Tarnogsky, and Sheksninsky districts. Representativeness of the sample is ensured by observing the following conditions: proportions between urban and rural population; proportions between residents of settlements of various types (rural settlements, small and medium-sized cities); gender and age structure of the adult population in the region. Survey method is questionnaire at the place of residence of respondents.

For each of these periods, four "waves" of surveys were conducted (in February, April, June and August), which made it possible to carry out a comparative analysis of key indicators of public sentiment, based on the estimates of six thousand respondents representing 14 socio-demographic strata[12].

According to the results of the survey (February – August 2022 in comparison with February – August 2021), we can say that the majority of citizens support the activities of the RF President, and their share after the start of the special operation has increased in all major socio-demographic groups (in the Vologda Oblast as a whole, the proportion of positive assessments of the activities of the head of state for February – August 2022 compared to February – August 2021 increased by 4 percentage points, from 52 to 56%; *Tab. 3, Insert 1*).

Table 3. Trends in key indicators of public sentiment in February – August 2022 compared to February – August 2021, % of respondents

	February – August 2021	February – August 2022	Dynamics (+/-)
Share of those who positively assess the work of the RF President	51.5	55.8	+4
Share of those who positively assess their social mood	64.3	68.7	+5
Source: VoIRC RAS public opinion monitoring.			

The share of those who assess their daily emotional state as positive has also increased (in the whole region by 5 percentage points, from 64 to 69%; *Tab. 3*), negative changes are not observed in any of the socio-demographic groups (*Insert 2)*.

From February to August 2022:

✓ the level of approval of the RF President's work in the region as a whole increased by 13 percentage points (from 48 to 61%; *Tab. 4*);

✓ the share of positive assessments of social mood has not changed and amounted to 70% (while from April to August 2022, the share of people describing their mood as "normal, good" has *increased: by 3 percentage points, from 67 to 70%; Tab. 4*);

✓ the Consumer Sentiment Index[13], reflecting people's forecasts about the future of the Russian economy and their own financial situation, amounted to 84–86 points (at the same time, from April to August 2022, it increased by 4 points, from 80 to 84 points; Tab. 4);

✓ protest potential[14] decreased by 2 percentage points (from 23 to 21%; *Tab. 4*).

[12] The total number of respondents in each socio-demographic group is presented in the table:

Population group (number of respondents, persons)		February – August 2021	February – August 2022
Sex	Men	2684	2684
	Women	3316	3316
Age	Under 30	880	867
	30–55	2824	2832
	Over 55	2296	2301
Education	Incomplete secondary and secondary	1956	2215
	Secondary vocational	2282	2174
	Incomplete higher and higher	1753	1606
Income groups	Bottom 20%	1064	1077
	Middle 60%	3186	3232
	Top 20%	1064	1077
Territories	Vologda	1595	1588
	Cherepovets	1617	1620
	Districts	2788	2792
	Oblast	6000	6000

[13] The Consumer Sentiment Index is calculated based on the answers to the questions:

1. How do you assess the financial situation of your family: is it better or worse than it was a year ago? (answer options: "better", "worse").

2. If we talk about large purchases for the home, then, generally speaking, in your opinion, is now a good or bad time to buy most of such products? (answer options: "good", "bad").

3. Do you think that in a year your financial situation will be better, worse or about the same as it is now? (answer options: "it will be better", "it will be worse", "it will be the same").

4. Do you think the next 12 months will be a good time for the country's economy, a bad time for it, or will they be something else? (answer options: "good", "bad").

5. If we talk about the next five years, will they be a good or bad time for the country's economy? (answer options: "good", "bad").

Private indexes are calculated for each question. To do this, the proportion of negative responses is subtracted from the proportion of positive responses, then 100 is added to the resulting value so as not to have negative values. Thus, completely negative answers would give a general index of 0, positive – 200, the equilibrium of the first and second expresses the index value of 100 (neutral index value).

The arithmetic mean of the private indices gives the aggregate value – the Consumer Sentiment Index.

[14] The protest potential is the proportion of respondents who answered the question "What are you ready to do to protect your interests?" as follows: "I will participate in a rally, demonstration"; "I will participate in strikes, protest actions"; "If necessary, I will take up arms, I will take to the streets".

Table 4. Trends in key indicators of public sentiment in February – August 2022, % of respondents

	Feb. 2022	Apr. 2022	June 2022	Aug. 2022	Dynamics (+/), Aug. 2022 to	
					Feb. 2022	June 2022
Share of positive assessments of the activities of the RF President	48.0	56.3	58.0	60.9	+13	+3
Share of positive assessments of social mood	69.3	66.5	68.7	70.1	+1	+1
Consumer Sentiment Index (CSI), points	85.7	80.2	81.9	83.9	-2	+2
Protest potential	22.7	19.3	17.5	20.5	-2	+3
Source: VolRC RAS public opinion monitoring.						

Thus, the all-Russian VCIOM research and VolRC RAS regional sociological surveys indicate, first, that against the background of the actualization of external threats, Russian society is consolidating around the head of state; second, that the measures taken by the state to mitigate the negative impact of sanctions on the standard of living and quality of life and preserve the usual lifestyle of citizens is supported by public opinion assessments.

There remain more conceptual and strategic tasks that are of fundamental importance and relate to achieving **"spiritual sovereignty"**, dominating (as experts note) over all others; gaining "**sovereign thinking**... as an impossibility to continue copying the West and its norms, standards and rules"[16], and also "**civilizational indifference**... as an awareness of the fact that we are strangers to Europe"[17].

The solution of these tasks is impossible without understanding a clear image of the future of Russia and without the presence of a certain Russian idea or ideology. **For Russia, this is, in fact, also a Rubicon, but no longer an external one (defining its attitude toward the Collective West), but an internal one, connected with the achievement of its own "spiritual sovereignty".**

> **"The sovereignty of any state means the isolation of its sphere of spiritual production...**
>
> **Spiritual (conceptual) sovereignty is primary** in relation to technological, military, economic and political sovereignty, and it is impossible to build it on the basic principles of the imported worldview"[15].

> "We are now turning to the fundamental questions of our being. And the special military operation is a catalyst for this process of understanding our place in the world, and of course, we need an image of the future..."[18]
>
> "The question about the Russian civilization is not due to the presence of certain cultural traits that connect us with the past, but to the presence in Russia of an "image of the future" to which our society would aspire, an image that would be an alternative to the Western one"[19].

[15] Khaldey A. Transfer and the strategy of sovereignty: Customers and performers. *Zavtra*. July 29, 2022. Available at: https://zavtra.ru/blogs/transfer_i_strategiya_suvereniteta_zakazchiki_i_ispolniteli

[16] Dugin A. Rejection of the Bologna system and ideological convulsions of the elites. *Zavtra*. June 8, 2022. Available at: https://zavtra.ru/blogs/otkaz_ot_bolonskoj_sistemi_i_ideologicheskie_sudorogi_elit

[17] Mezhuyev B. (2022). Is Russia's "civilizational indifference" toward the Collective West possible? *Ekspert*, 26, p. 70.

[18] Glazyev S.Yu. Russia is fighting for the preservation of humanity. Official website of S. Glazyev. June 17, 2022. Available at: https://glazev.ru/articles/153-geopolitika/103254-rossija-vojuet-za-sokhranenie-chelovechestva

[19] Mezhuyev B. (2022). Is Russia's "civilizational indifference" toward the Collective West possible? *Ekspert*, 26, p. 69.

Insert 1

The share of positive assessments of the RF President's work, in various socio-demographic groups
(question: "How do you currently assess the work of the RF President"; answer option is "I fully and mostly approve"), % of respondents

Population group		Average for February – August 2021	Average for February – August 2022	Dynamics (+/-)
Sex	Men	48.1	52.4	+4
	Women	54.2	58.6	+4
Age	Under 30	45.4	51.9	+7
	30–55	49.8	53.4	+4
	Over 55	56.1	60.3	+4
Education	Incomplete secondary and secondary	46.6	50.3	+4
	Secondary vocational	51.6	56.8	+5
	Incomplete higher and higher	56.8	62.0	+5
Income groups	Bottom 20%	37.1	40.1	+3
	Middle 60%	54.8	58.3	+4
	Top 20%	62.6	62.7	0
Territories	Vologda	46.6	47.2	+1
	Cherepovets	57.2	61.7	+5
	Districts	51.0	57.3	+6
	Oblast	***51.5***	***55.8***	***+4***
Total interviewed for February – August (people)		*6000*	*6000*	
Source: VolRC RAS public opinion monitoring.				

In general, in the Vologda Oblast for the period from February to August 2022, compared to the same period last year, the share of positive assessments of the RF President's work increased by 4 percentage points (from 52 to 56%). Positive changes are observed in all major socio-demographic groups, except for residents of Vologda and 20% of the most affluent citizens of the region (in these groups, population estimates have not changed).

It is worth noting an increase in the level of approval of the work of the head of state among the following groups:

- ✓ persons under the age of 30 (by 7 percentage points, from 45 to 52%);
- ✓ residents of districts (by 6 percentage points, from 51 to 57%)

The lowest level of approval of the RF President's work is noted among people who, according to self-estimates of income, belong to the category of bottom 20% residents of the region (40%). However, in this group, the support for the head of state increased by 3 percentage points (from 37 to 40%), while among the 20% of the most affluent segments of the population, the share of positive assessments in February – August 2022, as in February – August 2021, was 63%.

Insert 2

The share of positive assessments of social mood in various socio-demographic groups
(question: "What could you say about your mood in recent days?", answer option is "excellent mood; normal, good condition"),
% of respondents

Population group		Average for February – August 2021	Average for February – August 2022	Dynamics (+/-)
Sex	Men	63.2	67.8	+5
	Women	65.2	69.3	+4
Age	Under 30	70.9	78.1	+7
	30–55	67.8	70.7	+3
	Over 55	57.4	62.6	+5
Education	Incomplete secondary and secondary	59.7	66.5	+7
	Secondary vocational	65.0	69.9	+5
	Incomplete higher and higher	68.5	69.7	+1
Income groups	Bottom 20%	50.8	59.0	+8
	Middle 60%	65.5	69.1	+4
	Top 20%	77.5	79.0	+2
Territories	Vologda	58.0	61.5	+4
	Cherepovets	68.9	72.5	+4
	Districts	65.2	70.5	+5
	Oblast	***64.3***	***68.7***	***+5***
Total interviewed for February – August (people)		*6000*	*6000*	
Source: VolRC RAS public opinion monitoring.				

In February – August 2022, compared with February – August 2021, the share of Vologda Oblast residents who describe their daily mood as "normal, beautiful, good" increased by 5 percentage points (from 64 to 69%). Positive changes were recorded in all socio-demographic groups, except for people with incomplete higher and higher education, as well as representatives of the category of 20% of the most affluent residents of the region (in these groups, the share of positive assessments of social mood remains stable).

The most significant changes in the dynamics of positive assessments of social mood occurred in the following groups:

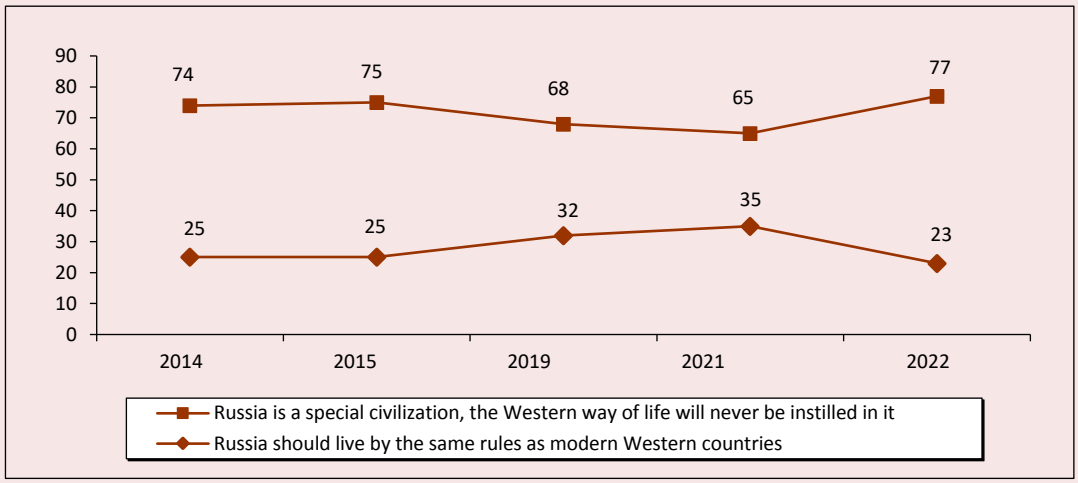
- ✓ persons under the age of 30 (proportion of positive characteristics increased by 8 percentage points, from 70 to 78%);
- ✓ persons with incomplete secondary and secondary education (the share of positive ratings increased by 7 percentage points, from 60 to 67%);
- ✓ people who, according to self-estimates of income, belong to the category of top 20% (by 8 percentage points, from 51 to 59%).

The complexity of the task of achieving "spiritual sovereignty" lies not only in the amorphous nature of its criteria and deadlines for implementation.

The results of all-Russian sociological surveys indicate that for at least eight years (since 2014), the proportion of Russians who believe that "Russia is a special civilization, a Western way of life will never be instilled in it" is almost three times higher than the proportion of those who believe that "Russia should live according to the same rules as modern Western countries". Moreover, for the period from 2021 to 2022[20] it increased by 12 percentage points (from 65 to 77%; *Fig. 1*).

According to experts, in Russian society there is a "request for a common destiny"[21] and along with it, there is an understanding of its components: "social justice" (47%), "a strong government that ensures order and development" (40%), "preservation of national traditions, moral and religious values" (39%), "ensuring human rights, democracy, freedom of expression of the individual" (39%), the idea of Russia as a "great world power that unites different peoples" (35%)[22].

Figure 1. Dynamics of attitudes of Russians toward the Western civilizational model or special Russian civilizational model, % of respondents



Source: *Rossiiskoe obshchestvo v usloviyakh novykh vyzovov i ugroz (kontekst sotsiologicheskoi diagnostiki)* [Russian Society in the Context of New Challenges and Threats (Context of Sociological Diagnostics). FNISTs RAN. Moscow, 2022. P. 115.

[20] The latest survey was conducted in March 2022 (source: *Rossiiskoe obshchestvo v usloviyakh novykh vyzovov i ugroz (kontekst sotsiologicheskoi diagnostiki)* [Russian Society in the Context of New Challenges and Threats (Context of Sociological Diagnostics). FNISTs RAN. Moscow, 2022. P. 115).

[21] EISI experts discussed the phenomenon of consolidation of Russian society (V. Poturemsky's opinion, Institute of Social Marketing). *Rossiyskaya gazeta*. May 4, 2022. Available at: https://rg.ru/2022/05/04/eksperty-eisi-obsudili-fenomen-konsolidacii-rossijskogo-obshchestva.html

[22] *Rossiiskoe obshchestvo v usloviyakh novykh vyzovov i ugroz (kontekst sotsiologicheskoi diagnostiki)* [Russian Society in the Context of New Challenges and Threats (Context of Sociological Diagnostics). FNISTs RAN. Moscow, 2022. P. 187.

"The comprehension of historical experience in the light of modern problems and requests demonstrates a certain (albeit weakly expressed) increase in the proportion of our fellow citizens who believe that **socialism is more fit for Russia than capitalism**.

Nowadays, there is a new reading, rethinking by society of the very idea of change and the way of development of the country... **today, in the minds of our fellow citizens, the path chosen by the country and the "changes" no longer contradict each other. The current "path" to a great extent represents the expected "changes" in Russia... currently, the path of Russia is understood through the concept of an original Russian model of the world order, its civilizational sovereignty"**[23].

In other words, expert assessments, public opinion surveys, and the results of the 2020 vote on constitutional amendments (which were supported by 79%, or almost 58 million Russian voters) show that **broad strata of Russian society would like to see Russia as a welfare state based on the rule of law, social justice, and the priority of traditional spiritual and moral values**.

The achievement of this socio-political consensus (especially strengthened after the Crimean Spring of 2014) is one of the results of the presidential activity of Vladimir Putin, who initially saw three pillars in the new post-Soviet statehood he was building: "The Russian idea", "A strong state" and "An efficient economy" (and precisely in this sequence[24]).

"There is no need to talk about sovereignty in Russia. As a matter of fact, this sovereignty has already been acquired; **the task is to fill this sovereignty with some real civilizational content"**.

However, the positions on which consensus has now been reached in Russian society **are just contours that require filling with "real civilizational content".** What this content will be is a question that remains open for now.

The data of the all-Russian and regional surveys of the expert community show that "the desired future of Russia and the really predicted situation in the country in the medium term do not just differ, but are in many ways opposite"[26] (*Insert 3*). And this skepticism is perhaps one of the main reasons explaining exactly how experts assess the state of Russian society after the start of the special operation: "The country is in a very unusual state. It is like hovering between the past that has already ended and the future that has not yet begun, or rather, it has begun, but has not yet been realized and accepted... We have irrevocably and radically broken with the West. But we have not comprehended it yet"[27].

What are the "roots" of this skepticism? The special military operation has shown that people's doubt (or rather even disbelief) that the desired image of the future can become really achievable comes from the deep penetration of the values and ideals of the culture of the consumer society (liberal capitalist ideology) into the very fabric of the Russian elite, by which we understand not only (although above all) representatives of the ruling circles, but also many politicians, businessmen, cultural and art figures, show business celebrities, etc.

[23] *Rossiiskoe obshchestvo v usloviyakh novykh vyzovov i ugroz (kontekst sotsiologicheskoi diagnostiki)* [Russian Society in the Context of New Challenges and Threats (Context of Sociological Diagnostics). FNISTs RAN. Moscow, 2022. Pp. 188, 234.

[24] Putin V.V. Russia at the turn of the Millennium. *Nezavisimaya gazeta*. January 30, 1999. Available at: https://www.ng.ru/politics/1999-12-30/4_millenium.html

[25] Mezhuyev B. (2022). Is Russia's "civilizational indifference" toward the Collective West possible? *Ekspert*, 26, p. 71.

[26] Ilyin V.A., Morev M.V. (2018). Revisiting the issue concerning the future of Russian statehood. *Economic and Social Changes: Facts, Trends, Forecast*, 11(5), p. 11.

[27] Dugin A.G. Integral sovereignty. Official website of the Izborsk Club. July 4, 2022. Available at: https://izborsk-club.ru/23057

Insert 3

Distribution of assessments of the need for various factors (conditions) to achieve the **desired situation** in Russian society by 2020 (average score on a scale from 1 – no need to 10 – absolutely necessary), points*

Data of the all-Russian survey (IS RAS, 2015)		Data of the survey conducted in the Vologda Oblast (VolRC RAS, 2018)	
1. Rotation of the political elite in the center and in regions	8.5	1. Changing the attitude of the state toward the sphere of culture, education and science, refusal to commercialize this sphere	9.8
2. Conducting transparent (with public control) and legitimate elections at all levels of government	8.1	2. Stability of legislation, "rules of the game"	9.5
3. Stability of legislation, "rules of the game"	8.0	3. Conducting transparent (with public control) and legitimate elections at all levels of government	9.3
4. Changing the attitude of the state toward the sphere of culture, education and science, refusal to commercialize this sphere	7.7	4. Maintaining the foreign policy course to restore Russia's strong role in world politics and independence, active protection of national interests	9.2
5. Strengthening the role of representative authorities, development of multiparty system	7.2	5. Rotation of the political elite in the center and in regions	8.5
6. Lifting of sanctions by Western countries, restoration of dialogue and relations with the West	6.7	6. Strengthening the role of representative authorities, development of multiparty system	7.8
7. Maintaining the foreign policy course to restore Russia's strong role in world politics and independence, active protection of national interests	6.4	7. Lifting of sanctions by Western countries, restoration of dialogue and relations with the West	7.7
8. Strengthening the influence of the Russian Orthodox Church, expanding the network of its parishes	3.6	8. Strengthening the influence of the Russian Orthodox Church, expanding the network of its parishes	4.8
9. Continuation of priority development of the raw materials sector of the economy, taking into account Russia's competitive advantages in the global division of labor; maintaining relatively low prices for labor and raw materials	3.0	9. Continuation of priority development of the raw materials sector of the economy, taking into account competitive advantages in Russia in the global division of labor; maintaining relatively low prices for labor and raw materials	4.3

* The wording of the question: "In your opinion, to what extent are the following conditions necessary to achieve the desired situation in Russian society by 2030?"
Factors that scored more than 5 points on a scale from 1 to 10, i.e. those that, according to experts, are the most necessary, are highlighted in green.

Expert surveys conducted by IS RAS in 2015[28] and VolRC RAS in 2018[29] showed that in the five-year perspective, the necessary factors for the **desired** development of the situation in Russia are "rotation of the political elite in the center and in regions, "stability of legislation and rules of the game", "holding transparent (with public control) and legitimate elections at all levels of government", "changing the attitude of the state toward the sphere of culture, education and science, refusal to commercialize this sphere", "strengthening the role of representative authorities, development of multiparty system".

[28] The expert survey was conducted by RAS Institute of Sociology with participation of the ZIRCON Research Group in July – October 2015; 154 experts took part in the survey: 94 from Moscow, 64 from various regions of the country. Five types of specialists were involved in the survey: state and municipal employees, officials, high-level managers, heads of state universities; representatives (heads) of business structures and business associations, commercial consulting centers; representatives (heads) of public associations, NGOs, independent intellectual organizations, clubs, etc.; journalists, publicists, actively speaking in the media with materials on the subject of research; researchers, scientists, specialists of analytical centers professionally engaged in studying the problems and prospects of the country's development (Source: Gorshkov M.K. et al. (2016). Rossiiskoe obshchestvo i vyzovy vremeni. Kniga chetvertaya. [Russian Society and the Challenges of the Time. Book Four]. Moscow: Ves' mir).

[29] The survey was conducted by VolRC RAS in the Vologda Oblast in February – March 2018. The sample included reputable specialists in their fields (managers, their deputies, people with significant work experience, candidates and doctors of sciences, etc.) representing those areas that, in our opinion, most fully reflect the situation in Russian society: government; business; "third sector" (non-profit organizations); mass media; science; 5–7 people were interviewed in each of the 5 key areas. The total sample size was 30 people.

Insert 3 (continued)

Distribution of **probability** estimates of **factors (conditions)** in the context of which the development of Russian society will take place in the next five years (average score of the degree of probability on a scale from 1 – unlikely to 10 – most likely), points*

Data of the all-Russian survey (IS RAS, 2015)		Data of the survey conducted in the Vologda Oblast (VoIRC RAS, 2018)	
1. Reduction of household incomes, rising prices and falling living standards, unemployment	7.7	1. Prolongation of Western sanctions against Russia; loss of the possibility of importing critical goods, resources, technologies, ideas	6.2
2. Prolongation of Western sanctions against Russia; loss of the possibility of importing critical goods, resources, technologies, ideas	7.6	2. A sharp increase in the demand for engineering and technical professions and specialties, demand for IT, reorientation of the labor market from the service sector to the production sector	5.4
3. A sharp drop in oil and gas prices, the crisis of the Russian oil and gas industry, a reduction in budget revenues	6.7	3. Reduction of household incomes, rising prices and falling living standards, unemployment	5.3
4. Destruction of the infrastructure of the social sphere (healthcare, education, culture), departure of professionals, reduction of staff and institutions, collapse of intra-industry communications	6.5	4. Destruction of the infrastructure of the social sphere (healthcare, education, culture), departure of professionals, reduction of staff and institutions, collapse of intra-industry communications	5.1
5. Tightening of domestic policy, reduction of citizens' rights and freedoms, introduction of formal and/or informal censorship in the media, etc.	6.4	5. Tightening of domestic policy, reduction of citizens' rights and freedoms, introduction of formal and/or informal censorship in the media, etc.	5.1
6. Mass dissemination of technologies for tracking citizens' behavior, total loss of privacy	6.3	6. Successful import substitution, development of non-resource sectors of the economy, improvement of the investment climate	5.0
7. Man-made and other disasters, major accidents, including those caused by the human factor	5.9	7. Mass dissemination of technologies for tracking citizens' behavior, total loss of privacy	4.7
8. Increased terrorist pressure on Russia (terrorist attacks, sabotage, intimidation)	5.1	8. Increased terrorist pressure on Russia (terrorist attacks, sabotage, intimidation)	4.7
9. A sharp increase in the demand for engineering and technical professions and specialties, demand for IT, reorientation of the labor market from the service sector to the production sector	4.6	9. A sharp drop in oil and gas prices, the crisis of the Russian oil and gas industry, a reduction in budget revenues	4.6
10. Large-scale war in Ukraine with direct or indirect participation of Russia and NATO countries	4.5	10. Man-made and other disasters, major accidents, including those caused by the human factor	4.2
11. Decrease in the influx of migrants from Asian countries into the country, increase in migration (workers, specialists) from European countries	3.7	11. Large-scale war in Ukraine with direct or indirect participation of Russia and NATO countries	3.8
12. Successful import substitution, development of non-resource sectors of the economy, improvement of the investment climate	3.7	12. Decrease in the influx of migrants from Asian countries into the country, increase in migration (workers, specialists) from European countries	3.5
*The wording of the question: "Please assess the probability of the following factors and conditions in the context of which the development of Russian society will take place in the next five years". Factors that scored more than 5 points on a scale from 1 to 10, i.e. those that, according to experts, are the most probable, are highlighted in green.			

The most probable negative factors under the influence of which the future of our country will be shaped, according to experts, are "a reduction in household incomes, rising prices and falling living standards, unemployment", "prolongation of sanctions by Western countries against Russia; loss of the ability to import critical goods, resources, technologies, ideas"; "a sharp drop oil and gas prices, crisis of the Russian oil and gas industry, reduction of budget revenue"; "destruction of the infrastructure of the social sphere (health, education, culture), departure of professionals, reduction of staff and institutions, collapse of intra-industry communications"; "tightening of domestic policy, reduction of citizens' rights and freedoms, introduction of formal and/or informal censorship in the media, etc.".

It is necessary to agree with experts that this is not an elite in the classical sense of this term (from the French: *elite*, which means "the best", "selected"), which implies, among other things, the presence of "high moral and civic qualities"[30]. "These are figures who occupy such socio-political positions that give them the opportunity to rise above the environment of ordinary people and make decisions with major consequences... those who occupy key positions in the economy, politics and other spheres of public life"[31]. **That is, these are persons who, by virtue of their publicity, possession of financial resources, authority, social status, popularity among the people, should bear the responsibility of practical implementation of the contours of the image of the future expected by broad segments of Russian society. They should, but in many cases they do not do this because of the priority of their own, personal goals and interests – power, money, fame, etc.**

The special military operation, launching, according to Vladimir Putin, the process of "natural and necessary self-purification of society ... which will strengthen our country, our solidarity, cohesion and readiness to respond to any challenges"[32], actually disclosed the names[33] of some people who are mentally and materially connected with the West and the Western way of life and who put personal interests, personal lifestyle and financial situation above the interests of the country and its citizens. At the same time, as experts note, there are "... open and latent globalists. The open ones left, the latent ones remained and still occupy their posts, too[35]. The presence of such people shows that **the interests of society that coincide in general with the initiatives of the President are still divided by a serious "gap" which does not allow the already formed, but so far only the contours of the image of the future to be filled with real content.**

> "It is no secret to anyone that the ruling class, which came after the "privatization" wave of the 1990s, and the bureaucracy and intelligentsia serving it, pursuing a line to surrender state interests and defending Russia's integration into the Western community, **have mostly retained their positions in government structures and are trying to realize their clan interests...** Although the purges have recently begun in this environment..., but **many have remained in their places and continue their destructive activities"**[34].

Therefore, for example, the need of Russian society for social justice (as one of the main such contours) continues to be extremely acute and the amendments to the Constitution of the Russian Federation adopted in 2020 did not affect its relevance in any way: from 2021 (when the amendments to the Constitution of the Russian Federation came into force) to 2022, the estimates of the population have not changed significantly: 60% of people consider modern Russian society unfair, 17–18% (that is, almost 3 times less) hold the opposite opinion (*Fig. 2*).

---

[30] Toshchenko Zh.T. (2012). The not very clean elite? *Poisk*, 21. Available at: https://poisknews.ru/magazine/3473/

[31] Ibidem.

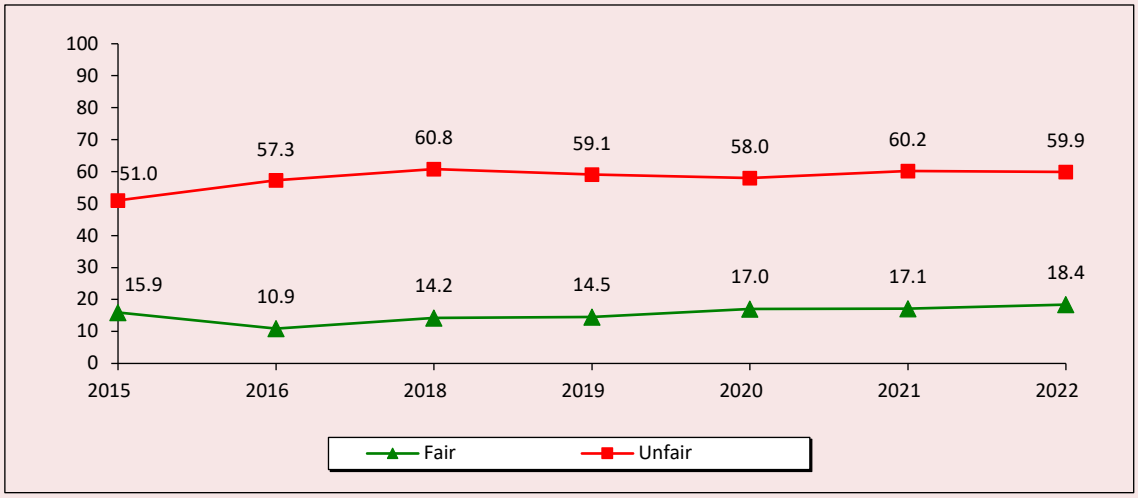
[32] Vladimir Putin's speech at the meeting on measures of socio-economic support for the regions on March 16, 2022. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67996

[33] Among them: former deputy prime ministers (A. Kohh, A. Chubais, A. Khloponin, A. Dvorkovich, I. Klebanov); businesspersons (M. Fridman, A. Panov, M. Prokhorov); cultural figures, journalists and show business celebrities (A. Pugacheva, M. Galkin, D. Dibrov, I. Urgant, R. Litvinova, A. Makarevich, K. Sobchak, A. Vasiliev), etc. (Sources: Khakassia Information Portal. Artel of prospectors. June 7, 2022. Available at: https://19rusinfo.ru/politika/12587-priyutili-na-svoyu-golovu-evropa-vzvyla-ot-khamstva-ukraintsev-i-tsen#menu; news portal Emigrating.ru. 18.08.2022. Available at: https://emigrating.ru/kto-pokinul-rossiyu-v-2022-godu-iz-za-ukrainy/#i-2).

[34] Apukhtin Yu. Why the Russian elite is opposed to conducting the special operation. *Voennoye obozrenie*. August 3, 2022. Available at: https://topwar.ru/199775-pochemu-rossijskaja-jelita-protivitsja-provedeniju-specoperacii.html

[35] Khaldey A. Why peace in Ukraine is impossible: About the "fatigue" of the cunning Russian elite. *Regnum*. July 26, 2022. Available at: https://regnum.ru/news/polit/3652253.htmll

Figure 2. Do you think Russian society as a whole is fair or unfair?*, % of respondents



* In 2022, the question was asked during each "wave" of the monitoring: in February, April, June, August.
Source: VolRC RAS public opinion monitoring.

Thus, the "welfare state" as an initiative of the head of state, coming from above together with the amendments to the Constitution of the Russian Federation, and "social justice" as a long-standing need of the general population, coming from below, ultimately have not yet "met". They exist in isolation, each at its own level: "welfare state" – at the upper level in the form of legislative and strategic documents, as well as in the public rhetoric of the authorities; "social justice" – at the lower level in the form of one of the basic needs of the population.

They did not come together "in the middle", because "in the middle" (as the special operation has shown) there is a cult of idleness and momentary entertainment, cheap scandalous popularity and individual enrichment. The society and the President see each other's needs and initiatives, feel their coincidence at the mental level, consolidate in the face of external threats, **but their common image of the future remains only a task that needs to be solved. The task requires, perhaps, a new social contract in which the ruling strata and elite circles are aware of their role and bear actual responsibility for the realization of national interests.**

The creation of such a social contract first of all requires actions on the part of the head of state – the same clear and rapid organization of the real implementation of the proposed idea, which he demonstrated in 2020 during the work to amend the Constitution of the Russian Federation (we recall that from the moment Vladimir Putin publicly announced the initiative to amend the text of the Constitution before the official adoption of the law "On the official publication of the Constitution of the Russian Federation with amendments", only six months have passed, from January to July 2020[36]).

[36] The proposal to amend the Constitution of the Russian Federation was announced by the head of state during his Address to the Federal Assembly of the Russian Federation on January 15, 2020.

From June 25 to July 1, 2020, an all-Russian referendum was held, during which 79% of voters (58 million people) supported amendments to the Basic Law.

July 3, 2020 the RF President signed a decree "On the official publication of the Constitution of the Russian Federation as amended" (the text of the decree is posted on the official website of the President of the Russian Federation. Available at: http://kremlin.ru/acts/news/63598).

Of course, it is difficult to argue with experts who note that "the fate of Russia and the future world order... will largely be determined by the results of the special military operation"[37], but it should also be recognized that the special operation will definitely end, and after the geopolitical situation in the world reaches a more or less stable state, the internal question of "what kind of state we are building" will arise, as they say, "point-blank".

The special operation achieved a similar effect in the form of "natural self-purification" of society in a slightly different aspect, but also directly related to the achievement of spiritual sovereignty. Strengthening the anti-fake legislation and the fight against foreign agents (*Insert 4* (*pp. 27–28*), *Tab. 5*),which was required by the hybrid specifics of the course of modern global conflicts (namely, the war on the information front), leads to the detection (and, accordingly, to the suppression of the possibilities of negative influence) of an increasing number of NGOs, media, individuals (including those directly related to the education of young people) who openly or semi-openly propagandize the values of consumer society and liberal capitalist ideology (including gender tolerance, which contradicts traditional moral values enshrined in the Constitution of the Russian Federation).

A number of experts note that the use of such entities or "sleeping agents" as a strategy of "canceling" Russia will be actualized by the West as the ineffectiveness of attempts at economic and military pressure becomes more and more obvious. It was this strategy that brought success to the Collective West in the Cold War of 1946–1991, which ended with the collapse of the Soviet Union.

> "The upcoming expected anti-Russian scenarios include **attempts to exacerbate tension in society. Both among the intelligentsia and within the governing class...**
>
> For almost 30 years... we were getting enough people oriented toward the West inside the country. And not so much young people, **but quite serious people holding relevant positions in large corporations, in other notable places.** These are what are called "sleeping agents". So far, no one has used them. **But today, the West is likely to use them to achieve its goals..."**[36]

Table 5. Foreign mass media, individuals, NPOs performing the functions of a foreign agent

	2020	2021–2022	Dynamics (+/-)
Mass media*	2	37	+35
Physical persons*	5	117	+112
NPOs**	5	12	+7

* Source: Register of Foreign Mass Media Performing the Functions of a Foreign Agent. Ministry of Justice of the Russian Federation. Available at: https://minjust.gov.ru/ru/documents/7755/ (latest data are as of July 29, 2022).
** Source: Register of NPOs Performing the Functions of a Foreign Agent. Ministry of Justice of the Russian Federation. Available at: http://unro.minjust.ru/NKOForeignAgent.aspx (latest data are as of August 12, 2022).

[37] Apukhtin Yu. Why the Russian elite is opposed to conducting the special operation. *Voennoye obozrenie*. August 3, 2022. Available at: https://topwar.ru/199775-pochemu-rossijskaja-jelita-protivitsja-provedeniju-specoperacii.html

[38] Pereslegin S. Strategies of the West and the sleeping ones. *Zavtra*. June 25, 2022. Available at: https://zavtra.ru/blogs/pereslegin_svo

Thus, the special military operation exposed an acute problem of post-Soviet society associated with a stable, long-term stay in power, in business, in the culture of specific people who share and cultivate (through their activities, their example, their biography, "success story") a system of values that contradicts the image of the future of Russia and its goals to achieve full national sovereignty. In fact, their efforts were the process of moral "decomposition"[39] of Russian society, which, in particular, is clearly demonstrated by the data of sociological research[40] (*Tab. 6*).

According to experts, the President and several people in his entourage, in fact, turned out to be the only "customers" of Russia's movement toward gaining full national sovereignty; without the support of the "class of the large national bourgeoisie". Part of today's Russian ruling circles, formed during

Table 6. Dynamics of people's attitudes toward various moral qualities, phenomena, actions for the period from 1996 to 2020*, % of respondents

Negative moral phenomena and actions	1996	2020	Dynamics (+/-) 2020 to 1996
Proportion of people to whom the following phenomena are not important			
Mutual assistance	13.6	21.9	+8
Tolerance, respect for the views and opinions of other people	11.9	19.4	+8
Decency	13.3	21.1	+8
Honesty, truthfulness	6.3	13.0	+7
Mutual assistance	7.1	13.8	+7
Proportion of people who consider the following phenomena acceptable and quite normal			
Laziness	22.3	42.6	+20
Desire to work less and earn more	36.1	49.1	+13
Arrogance, conceit	10.9	20.0	+9
Subservience, servility	9.0	15.7	+7
Disrespectful attitude toward a woman	5.6	11.4	+6
Proportion of people who do not feel remorse when committing such acts as…			
Unwittingly (or consciously) offending a person, rudeness	16.2	34.7	+19
Insufficient attention to parents (mother, father)	34.4	53.0	+19
Injustice you have committed under the pressure of circumstances or of your own free will	24.5	41.1	+17
An unfulfilled promise made to someone	25.3	39.9	+15
Bad attitude toward children (your own or those of others)	54.5	67.4	+13

* The table presents the answer options that show the most negative changes for the period from 1996 to 2020.
For more detail, see: Ilyin V.A., Morev M.V. (2022). A difficult road after the Rubicon. *Economic and Social Changes: Facts, Trends, Forecast,* 15(3), 9–41.
Wordings of the questions: "People evaluate different life phenomena in different ways. For some, one thing is important, for others – another…Which of the following is important to you and which is not?"; "Please, express your attitude toward the following phenomena …"; "Have you ever experienced guilt, remorse in the cases listed below or not?".
Source: data of the monitoring of the labor potential of the population of the Vologda Oblast, which has been carried out since 1996 once a year. The representativeness of the sociological data obtained is ensured by using a model of multi-stage zoned sampling with quota selection of observation units. The zoning structure includes two cities (Vologda and Cherepovets) and eight municipal districts with different levels of socio-economic development. The surveyed population is of working age – from 16 years old to retirement age (men – up to 59 years, women – up to 54 years inclusive; due to the increase in the retirement age from 2020 – 61 and 56 years respectively).

[39] S. Shoigu's speech at the panel discussion of the All-Russian Youth Educational Forum "Territory of Meanings" (August 2021). Available at: https://zavtra.ru/events/shojgu_nazval_strashnejshuyu_ugrozu_dlya_rossii

[40] In this article we present the quintessence of the results obtained – the number of positive and negative changes in the dynamics of public opinion assessments for the period from 1996 to 2020. More detailed information is provided in the article: Ilyin V.A., Morev M.V. (2022). A difficult road after the Rubicon. *Economic and Social Changes: Facts, Trends, Forecast*, 15(3), 9–41.

the 30th anniversary preceding the special military operation, **does not want and is even unable** to carry out those complex transformations of public consciousness that today dictate the conditions of the civilizational conflict. Many representatives of elite circles continue to live "the old-fashioned way" in a hope that everything will return to normal.

> "...who in Russia is capable of being a customer of the sovereignty strategy?.. **The main customer of the sovereignty strategy is Putin and several people in his entourage.** That is, it is a subjective factor. And there is no objective factor – the class of the large national bourgeoisie, which is determined to separate from the West..."[41]

> The elite "not only has no worldview for the last decisive battle with the West. Its **whole system of long-term interests is protesting against something like this**... The system has been providing philistine well-being for decades, **and it cannot and does not want to do anything else**"[42].

This, in particular, is indicated by such episodes as the story of the Russian athlete I. Kulyak, whom Russian officials banned from participating in national competitions after he publicly demonstrated his support for the Russian armed forces at the awarding of the World Cup in gymnastics[43]; it is also proved by attempts to let various representatives of show business, who left the country after the start of the special operation, return to the mainstream media[44].

At a time when "entire ministries, entire industries, entire segments of the government are zombified with the idea that the West is the goal and that Russia is its periphery"[45], **it is necessary to organize a planned transition from the old elites to the new ones** that are capable and internally motivated to implement complex changes that correspond to the national interests of Russia and the majority of its citizens, as well as those with relevant life experience and practical skills acquired not in offices, but in the course of real management in production, culture, science...

> "...this has been such a hypnosis for decades, that Russia is a hiccup, that it is necessary to focus on liberal values advocated by the West. This is a mass hypnosis that the West is the goal, Russia is its periphery... our entire education is based on this"[46].

At the same time, "planned transition" means the impossibility of a quick, revolutionary solution to the problem. According to experts, "the filth of the Time of Troubles cannot be eliminated by decree, with the stroke of a pen. This filth must be scraped off with steel scrapers. And it will not be possible to scrape it off everyone – for many it has become their essence. **So do not pretend that the current elites will easily readjust themselves. It does not work that way**"[47].

This should be a systematic work aimed at laying off those persons who do not fulfill the instructions of the President as the main "customer" of Russia's achieving full national sovereignty, as well as to

[41] Khaldey A. Transfer and the strategy of sovereignty: Customers and performers. *Zavtra*. July 29, 2022. Available at: https://zavtra.ru/blogs/transfer_i_strategiya_suvereniteta_zakazchiki_i_ispolniteli

[42] Kurginyan S. In order not to fall into the abyss. *Sut' vremeni*. June 30, 2022. Available at: https://eot.su/node/23743

[43] Soshenko A. Sports officials: Like goats chasing carrots. *Zavtra*. July 12, 2022. Available at: https://zavtra.ru/blogs/sportivnie_chinovniki_kak_kozli_za_morkovkoj

[44] For example, occasional appearances of Ivan Urgant at corporate events of Russian foundations and individuals; appearance of Aleksandr Vasiliev on the air of TV Channel One, etc.

[45] Dugin A. Elites have not yet realized that this situation will remain. *Radio Komsomolskaya pravda*. June 24, 2022. Available at: https://radiokp.ru/podcast/dialogi/635161

[46] Ibidem.

[47] Averyanov V.V. The battle for the renewal of the state is coming. Official website of the Izborsk Club. July 16, 2022.Available at: https://izborsk-club.ru/23090

replace these people with those who have proven their dedication to the national interests of the country and their professionalism with real deeds.

Some of the measures taken by the head of state to implement such systematic work, to improve the spiritual and moral atmosphere in the ruling strata and society as a whole, are presented in *Insert 4* (we started monitoring them in the previous article[48]).

Thus, the "test for stable development" that Russia is undergoing today in the context of a global civilizational conflict with the Collective West requires society to move toward overcoming the "internal Rubicon", toward overcoming the long-term hypnotic influence of the liberal-capitalist development paradigm; comprehension, formulation and acceptance of one's own system of spiritual and moral values corresponding to the traditional and already established contours of the image of the future of Russia, which are based on such concepts as "sovereignty", "welfare state", "social justice", "traditional values".

This primarily concerns the ruling, cultural, financial elites of the country, because, as experts note, "the most terrible challenge comes not from the West, or transnational networks, or the international finance, or megacorporations... **our main enemy is the low degree of awareness of the challenges facing civilization, as well as the inadequacy of a significant part of the still ruling elites to these challenges"[49].**

The national elite (not only the ruling class, but also figures of culture, art, science, business) should ultimately serve the national interests of the country, that is, the interests of the majority of its citizens, and not the interests of individuals, Western "curators" or even their own ones.

If we take into account that, according to scientists, from 50 to 75% of the economically active population of Russia belongs to the "precariat" – a "new phenomenon", "a new class that has taken the place of the proletariat, formed from almost all strata of modern society" and consisting of people who "do not have a clear vision of their future, are not confident in the security of their lives and the guarantee of a quiet old age at the time of their retirement"[50], then it becomes quite obvious that **in order to overcome the "inner Rubicon" it is necessary to fill the contours of the image of the future (the ideas already formed in society about the desired vector of Russia's development) with real content.** People should understand how they, their families, and children personally "fit" into this image of the future: what social guarantees they can really count on; what trajectories of professional and personal growth they can have, what opportunities they have so as to maintain and develop living standards, participate in the socio-political life of the country, etc.; they should feel that this future is not just desirable for them, but **understandable, predictable and really achievable** (at least in the perspective of future generations)...

> **"...for most Russians, it is still unclear what kind of society Russia is building. Common words – the welfare state, modernization – are not enough, because they are too abstract, similar to the all-encompassing promises inherent in almost every modern country...** In other words, without programs that would serve as a powerful impetus for the elevation of a person, it is impossible to imagine the further development of the country. And the more of them there are, the fewer people will feel like the precariat, at least spiritually and morally"[51].

[48] Ilyin V.A., Morev M.V. (2022). A difficult road after the Rubicon. *Economic and Social Changes: Facts, Trends, Forecast,* 15(3), 29–32.

[49] Averyanov V.V. The battle for the renewal of the state is coming. Official website of the Izborsk Club. July 16, 2022. Available at: https://izborsk-club.ru/23090

[50] Toshchenko Zh.T. (2018). *Prekariat: ot protoklassa k novomu klassu:monografiya* [The Precariat: From the Proto-Class to a New Class: Monograph]. Moscow: Nauka. P. 270.

[51] Ibidem. P. 269.

Insert 4

Monitoring the actions of federal state authorities to strengthen the internal foundations of national sovereignty[52]

June 28, 2022 – The RF President signed Law 1101162-7 "On amendments to certain legislative acts of the Russian Federation (in terms of determining the direction of the use of pension savings remaining after settlements with creditors of non-state pension funds)". According to experts, "for those who are not aware of the situation, this event passed unnoticed, but professional economists saw in it a number of truly revolutionary and fateful changes ..." This innovation "financially blocks offshore companies and, at the same time, legal withdrawal of funds abroad, actually delegates to the government the determination of the current U.S. dollar exchange rate, grants the President extremely broad powers to ensuring the financial stability of Russia... The law took Nabiullina out of the game... In recent months, the President has developed a **managerial technique to leave team members on the ground and at the same time deprive them of their powers...** In fact, a "financial extraordinary commission" is being created, which will determine the rules of the financial game in the economy. Moreover, it is far from certain that it will include Nabiullina, Siluanov, Kudrin, but for sure – Mishustin, Belousov, Egorov"[53].

June 29, 2022 – in Moscow, the heads of three metropolitan theaters were replaced: A. Yakovlev was appointed artistic director of the Gogol Theater (the former Gogol Center) instead of K. Serebrennikov; in the School of Modern Play, the place of J. Reichelhaus will be taken by D. Astrakhan; V. Ryzhakov was dismissed from Sovremennik, and the artistic policy of the theater will be determined by the artistic council. All three former leaders have repeatedly shown anti-Russian rhetoric (in their actions, statements, theatrical productions). According to experts, **"the cultural leadership of state institutions has finally decided to "take out the trash"**, which is quite a timely decision given the current circumstances... all the three theaters are under the jurisdiction of the Department of Culture of Moscow, and most of the theaters, while subordinate to this department, alas, enjoy notoriety among "traditional" viewers, because they are engaged in the most liberal and "free", experimental art and resonant appointments to leadership positions, with rare exceptions. It turns out that an iron hand has reached out to this budget cluster as well"[54].

June 30, 2022 – RANEPA rector V. Mau was arrested on charges of embezzlement of the Academy's funds. As experts noted, this became "**a landmark event; a serious blow to the entire liberal-monetarist spectrum; another important step toward current Russia's break up with the Yeltsin era**". Currently V. Mau has been released on his own recognizance, but the investigation on his case continues.

July 8, 2022 – the RF President met with the leaders of the State Duma factions; at the meeting, **"the priorities in the socio-political field were sorted out"**[55]. In an interview with deputies, Vladimir Putin "clearly outlined Russia's priorities in a rapidly changing world in connection with the special operation in Ukraine"[56]: "The policy of the parliament is based on the will of the people of Russia, our firm position and conviction that we are on the right side of history, on the unwavering resolve of the vast majority of the country's citizens to uphold Russia's sovereignty and to help our people in Donbass. This is what underlies the policy of our state in general"[57].

---

[52] Insert 4 presents a continuation of the monitoring of management decisions of the authorities, which we started in the previous article: Ilyin V.A., Morev M.V. (2022). A difficult road after the Rubicon. *Economic and Social Changes: Facts, Trends, Forecast*, 15(3), 29–32.

[53] Economist Krichevsky: Putin has put Nabiullina on the sidelines. Available at: https://sibkray.ru/news/2127/957162/

[54] Borodina D. In three Moscow theaters, artistic directors with an anti-war and Russophobic position were dismissed. Available at: https://readovka.news/news/103154

[55] "There is nothing more important and higher than the fate of the Fatherland!": The State Duma told about the meeting with the RF President. July 8, 2022. Available at: https://riafan.ru/23526656-_net_nichego_vazhnee_i_vishe_sud_bi_otechestva_v_gosdume_rasskazali_pro_vstrechu_s_prezidentom_rf

[56] And the unsinkable go down as well. Available at: https://zavtra.ru/events/i_nepotoplyaemie_tonut_arestovan_rektor_ranhigs_mau_podrobnosti

[57] Transcript of Vladimir Putin's speech at a meeting with leaders of the Duma factions on July 8, 2022. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/transcripts/68836

End of Insert 4

July 11, 2022 – the Presidential Decree[58] introduced a simplified procedure for obtaining Russian citizenship for all residents of Ukraine. Experts assessed this measure as "**a serious political step**... toward the denazification of Ukraine by radically separating it from the previous political regime"[59]; "having adopted this decision, he [the President] shows that he considers the whole of Ukraine as a Russian people who have the right to be part of Russia if they want. Apparently, it can also be regarded as a kind of **counter-response to the actions undertaken by the West"**[60].

July 14, 2022 – the RF President signed Federal Law 255 "On control over the activities of persons under foreign influence", according to which "a foreign agent may not carry out educational activities in relation to minors and pedagogical activities in state and municipal educational organizations"[61]. The law "is not so much about political dissenters, as in general about disloyal citizens, officials and businesspersons"[62]. According to experts, this is "a kind of code on foreign agents... **Its essence is the placement of all categories of foreign agents in the unified register of the Ministry of Justice, the unification of various prohibitions and restrictions"**[63].

July 15, 2022 – following the results of an extraordinary meeting of the State Duma, personnel changes took place in the public administration system: Minister of Industry and Trade D. Manturov became Deputy Prime Minister. Deputy Prime Minister Yu. Borisov, who was responsible for the defense industry, resigned from his position and headed Roscosmos, replacing D. Rogozin in this post. Experts assessed these appointments as "the first serious reshuffle after February 24"[64].

July 18, 2022 – Draft Law 165975-8 "On amendments to certain legislative acts of the Russian Federation regarding the prohibition of information promoting non-traditional sexual relations" was submitted to the State Duma. The draft law provides for a ban on the dissemination of information that denies family values and promotes non-traditional sexual relations; in particular, it is proposed not to issue film distribution certificate to films with the above content. As pointed out in the explanatory note to the draft law, "the denial of the family as a social value, the promotion of the so-called "childfree" lifestyle (without children) and the popularization of non-traditional sexual relations **are no less dangerous for the development of Russian society than... propaganda of suicide, drugs, extremism, criminal behavior"**[65].

July 31, 2022 – the Naval Doctrine of the Russian Federation and the Naval Charter of the Russian Navy have been approved. According to experts, these documents "meet the dictates of the time"[66]; "Russia is showing the whole world that it will defend itself by all available means"[67]. **For the first time, the main threats to Russia's national security include "the strategic course of the United States to dominate the oceans and their global influence on the development of international processes".** Also, the main threats include the promotion of NATO infrastructure to the Russian borders, Russia's dependence on maritime transportation and the functioning of offshore pipeline systems; international sanctions against shipbuilding enterprises of the industrial complex and oil and gas companies, etc.

[58] On amendments to Presidential Decree 183, dated April 24, 2019 "On the definition for humanitarian purposes of categories of persons entitled to apply for the citizenship of the Russian Federation under a simplified procedure: Presidential Decree 440, dated July 11, 2022; On certain categories of foreign citizens and stateless persons entitled to apply for the citizenship of the Russian Federation under a simplified procedure: Presidential Decree 187, dated April 29, 2019.

[59] Opinion of O. Agapov, advisor to the rector for strategic initiatives of Kazan Innovative University (source: https://www.tatar-inform.ru/news/eksperty-ukaz-putina-ob-uproshhennom-grazdanstve-dast-zashhitu-ukraincam-ot-kievskoi-xunty-5873887).

[60] Opinion of political scientist I. Grashchenkov (source: Why Putin invited all Ukrainians to become citizens of Russia. July 11, 2022. Available at: https://sevastopol.su/news/pochemu-putin-priglasil-vseh-ukraincev-stat-grazhdanami-rossii).

[61] On the control of the activities of persons under foreign influence: Federal Law 255-FZ, dated July 14, 2022. *Rossiyskaya gazeta*. July 19, 2022. Available at: https://rg.ru/documents/2022/07/19/document-inoagent.html

[62] Rodin I. Draconian laws will be applied not only to the opposition. *Nezavisimaya gazeta*. June 28, 2022.

[63] Ibidem.

[64] Cherkasov B. Personnel challenge: Why the Duma interrupted its holidays for the appointment of Denis Manturov. July 15, 2022.Available at: https://www.forbes.ru/mneniya/471739-kadrovyj-vyzov-pocemu-radi-naznacenia-denisa-manturova-duma-prervala-kanikuly?utm_source=yxnews&utm_medium=desktop

[65] Explanatory note to the draft law. Legislative support system. Available at: https://sozd.duma.gov.ru/download/2D204B07-B68D-4F90-BF3C-1D82B1FB47BA

[66] V. Dandykin (military expert) (source: Russia's Naval Doctrine is a response to U.S. ambitions in the Arctic. *Vzglyad*. July 31, 2022. Available at: https://vz.ru/news/2022/7/31/1170278.html)

[67] Hero of the Russian Federation Rear Admiral I. Kozlov (source: Ibidem).

The activity of the head of state in this direction testifies to his awareness of this task (or even mission). However, as Academician S.Yu. Glazyev notes, "the emergence of a new management system, and this is primarily the relationship between people, **cannot but be combined with a new system of ideas, views and principles**"[69]. Therefore, the complex contradiction between the objective need to overcome the boundaries of the existing liberal-capitalist paradigm and the inability of the Russian elites to implement this step is a task that cannot be solved by personnel reshuffles and high-profile arrests alone.

This requires an ideology – based on public interests, a reflexive and formulated understanding of the "Russian idea", which Vladimir Putin spoke about back in 1999[70]; **understanding the image of the state, which by and large we have only begun to build after the events of February 2022.**

"Ideology is:

✓ the logical and psychological **behavioral basis of the political management system;**

✓ **a system** of views and ideas, political programs and slogans, philosophical concepts in which **people's attitudes toward reality and toward each other are realized and evaluated, which express the interests of various social classes, groups, societies;**

✓ **a set of principles, norms and rules** that define, establish and regulate relations within the sphere of social production and consumption"[71].

* * *

As we know, history is cyclical, and Russia has repeatedly been in a situation where, in the face of external threats, it was necessary to implement rapid and complex changes in the training of personnel of a new formation corresponding to the prevailing historical period, providing the necessary changes in the management system and economic life.

Here is an example. On May 4, 1935, while addressing the graduates of military academies in the Kremlin Palace, General Secretary of the Central Committee of the All-Union Communist Party (Bolsheviks) Joseph Stalin delivered a speech, the quintessence of which, one might say, became historical, since the cadres trained by the Bolshevik Party ensured that the Soviet Union managed not only to survive, but also to defeat fascist Germany, which was a direct threat to the existence of the country.

"The question that confronted us was: EITHER we solve this problem in the shortest possible time and consolidate socialism in our country, OR we do not solve it, in which case our country – weak technically and unenlightened in the cultural sense – **will lose its independence and become a stake in the game of the imperialist powers...**

It is time to realize that of all the valuable capital the world possesses, the most valuable and most decisive is people, cadres. It must be realized that under our present conditions 'cadres decide everything'"[72].

[69] Glazyev S.Yu. Russia is fighting for the preservation of humanity. Official website of S. Glazyev. June 17, 2022. Available at: https://glazev.ru/articles/153-geopolitika/104465-rossija-vojuet-za-sokhranenie-chelovechestva

[70] Putin V.V. Russia at the turn of the Millennium. *Nezavisimaya gazeta*. January 30, 1999. Available at: https://www.ng.ru/politics/1999-12-30/4_millenium.html

[71] Mochar K.Yu. (2019). Ideology as a creative force of society. In: *Istoriya i sovremennost'* [History and Modernity]. Issue 4(34). Available at: https://www.socionauki.ru/journal/articles/2433435/

[72] Joseph Stalin's speech before the graduates of military academies on May 4, 1935. Online Library Dslov.ru. Available at: https://dslov.ru/txt/t10.htm

In 2017, in the article "Significance of the thesis 'Cadres decide everything' as applied to modern Russia"[73] we drew attention to the importance of personnel policy for the implementation of Russia's national development goals, which are stalled due to the fact that the personnel did not ensure timely and complete fulfillment of the RF President's instructions. To this end, we published the full text of Stalin's speech, focusing on the most important points.

In the five years that have passed since then, Russian President Vladimir Putin has made many key and system-forming steps toward strengthening Russian statehood: the Constitution of the Russian Federation and the National Security Strategy have changed, new people have appeared in the government (including the chairman of the Cabinet of Ministers), the possibilities of negative influence of foreign agents receiving funding from abroad (including from countries that are unfriendly toward Russia) were virtually leveled out, and much more.

However, after February 24, 2022, when Russia, in fact, opened a new page in its history and when the question of the possibility of its sovereign future acquired a new level of urgency, the task of improving the effectiveness of personnel policy became even more important than five years ago.

Only cadres are capable and must ensure that our country achieves full and therefore spiritual, military, economic, political, territorial national sovereignty.

References

Mezhuyev B. (2022). Is Russia's "civilizational indifference" toward the Collective West possible? *Ekspert,* 26.

Mochar K.Yu. (2019). Ideology as a creative force of society. In: *Istoriya i sovremennost'* [History and Modernity]. Issue 4(34). Available at: https://www.socionauki.ru/journal/articles/2433435/

Rossiiskoe obshchestvo v usloviyakh novykh vyzovov i ugroz (kontekst sotsiologicheskoi diagnostiki) [Russian Society in the Context of New Challenges and Threats (Context of Sociological Diagnostics). FNISTs RAN. Moscow, 2022.

Gorshkov M.K. et al. (2016). *Rossiiskoe obshchestvo i vyzovy vremeni. Kniga chetvertaya.* [Russian Society and the Challenges of the Time. Book Four]. Moscow: Ves' mir.

Toshchenko Zh.T. (2018). *Prekariat: ot protoklassa k novomu klassu:monografiya* [The Precariat: From the Proto-Class to a New Class: Monograph]. Moscow: Nauka.

Toshchenko Zh.T. (2012). The not very clean elite? *Poisk,* 21. Available at: https://poisknews.ru/magazine/3473/

[73] Ilyin V.A. (2017). Significance of the thesis "Cadres decide everything" as applied to modern Russia. *Economic and Social Changes: Facts, Trends, Forecast*, 10(3), 9–31.

Information about the Authors

Vladimir A. Ilyin – RAS Corresponding Member, Doctor of Sciences (Economics), Professor, Honored Scientist of the Russian Federation, scientific director, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: ilin@vscc.ac.ru)

Mikhail V. Morev – Candidate of Sciences (Economics), Leading Researcher, deputy head of department, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: 379post@mail.ru)

DOI: 10.15838/esc.2022.4.82.2
UDC 316, LBC 60.5

WHO in Russia Embodies the Struggle for the Preservation of Mankind?

Zhan T.
TOSHCHENKO
Russian State University for the Humanities
Institute of Sociology – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: zhantosch@mail.ru

Abstract. The paper provides an analysis of the main ideas of the article by S.Yu Glazyev "Russia is fighting for the preservation of mankind" (newspaper Zavtra, April 6, 2022), in which an important, actually central place is occupied by reflections on the role and significance of social consciousness and state ideology. However, the article pays little attention to the questions of WHO embodies the struggle, WHO the bearer of social consciousness is, and WHOSE INTERESTS should be expressed by the state ideology in modern Russia. In accordance with this goal, an analysis of the role of social consciousness in the historical destinies of peoples, the place and role of state ideology is carried out. The characteristics of the main classes and communities (strata) in modern Russian society and their worldview attitudes and orientations are given. Particular attention is paid to the precariat, which, in the author's opinion, determines the face of modern Russian society. The conclusion is substantiated that worldview, ideological positions are not only a part of public life, but a certain penetrating component that concerns not only culture, but also all spheres of economic, social and political activity.

Key words: social consciousness, ideology, worldview, classes, precariat.

For citation: Toshchenko Zh.T. (2022). Who in Russia embodies the struggle for the preservation of mankind? *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 32–41. DOI: 10.15838/esc.2022.4.82.2

Assessing the role of social consciousness

I agree with the main points expressed in the article and would like to dwell upon some fundamental ideas.

I find it very important that Sergei Yu. Glazyev highlights the following statement: "Within the framework of a new world economic order, wars are now going on for consciousness, for the minds of citizens of different countries and, unlike the war of the last century, the current war is a war, first of all, for the dominance in social consciousness". And when he says that the third factor is ideology and its role and significance in the transformation of the world (in his opinion, monetary and financial problems rank third), this is also, in fact, a conversation about social consciousness, or rather, about that special part of it, which is represented by state policy and ideology that acquire paramount importance in addressing internal and geopolitical issues.

However, in my opinion, the significance and role of social consciousness have been felt throughout the whole recent history and not just the current situation. Let me remind you of a well-known fact that is not always given due attention. In the Bundestag election in 1932, the NSDAP (Hitler's party) received 33.1% of the vote, and more than half of Germans voted for the Social Democrats and Communists. But since the coalition of supporters of socialism did not take shape, the post of chancellor was occupied by Hitler. And immediately there began an accelerated and a rather successful reformatting of the social consciousness of the German people, who were being fed with the fascist ideology, according to which the main thing in the life of society is not classes, as in Marxism, but belonging to a race, to a chosen ethnic group, to which, they said, the Germans belong. And it is this higher race that should rule the world. This direction in the policy of the German fascists proved to be successful, since after eight years, by 1941, most Germans were infected with the fascist ideology, which they clearly demonstrated during the hostilities on the territory of many states, but especially in our country. Some figures in the USSR could not believe this for a long time and claimed in their pre-war articles and speeches that German soldiers, being representatives of the working class, would never take arms against their brothers – Soviet workers who were building socialism, which most Germans aspired to. Reality refuted that delusion. The German army for the most part consisted of convinced fascists who showed themselves by bloody deeds both at the front and in the occupied territory.

Currently, the campaign to reformat the social consciousness of the Ukrainian population, especially after 2014, after the accession of Crimea to the Russian Federation, has been no less successful. Signs of an essential change in the social consciousness of Ukrainians appeared long before that, in the process of the collapse of the USSR, when nationalist ideas came to the fore, as S.Yu. Glazyev points out. I had a conversation with Academician of the National Academy of Sciences of Ukraine P.P. Tolochko, who told me that he had met with Russia's ambassador to Ukraine Viktor Chernomyrdin twice and expressed his concerns that Russia had been neglecting the work with the population and youth of Ukraine, while the United States and its satellites had been spending huge amounts of money on grants and training in their countries, on the creation of appropriate public and political organizations, on the formation of pro-Western forces. Tolochko noted bitterly that Chernomyrdin had replied: "Do not exaggerate the situation. We give Ukraine gas and oil, which they cannot do without". But history has clearly shown that you can do without them, you bet. Let us face it. The consciousness of many Ukrainians, especially young people, is poisoned by nationalist, anti-Russian and anti-Soviet propaganda.

To this we can add that the nationalist mood (and here Glazyev is right) is an important and, to a certain extent, decisive component of the policies and ideology of many post-Soviet countries (and not only them).

And other ideas that S.Yu. Glazyev (anti-Russian xenophobia, liberal ideas, English and American anti-Sovietism, hybrid warfare) also largely address the problems of social consciousness and its mobilization to achieve geopolitical goals.

WHO claims to be a leader in the Russian social consciousness?

Referring to the experience of China and India, S.Yu. Glazyev advocates the idea that Russia should realize the importance of working with social consciousness and the need to have a state ideology; thus, he leaves open the question of WHO will embody this need for a new ideology or, in the language of philosophy, who will be the subject determining the social consciousness and a supporter of state politics. In other words, for the successful existence of the state, it is necessary to have a social contract concluded between the state and the people; the contract is the criterion and guarantor of the existing system. We can agree with the author that such criteria that ensure the strength of ideological understanding are awareness of one's unity with the fate of one's people and country, guarantees of well-being, and a clear understanding and idea of one's future.

But how are these criteria really expressed in the minds of the main classes, communities and social groups that constitute Russian society?

Let me note right away that despite some liberal and postmodern statements according to which classes have disappeared and do not exist in the modern world, they still do: they have acquired a different form of expression and other indicators (criteria) of their existence compared to those features that the Marxist understanding endowed them with for a long time in the past. The real socio-economic situation has changed dramatically. The former characteristics have lost the role they played in the days of classical capitalism. By the end of the 20th – beginning of the 21st century, new social strata appeared that occupied a specific place (especially the service sector), which led to a significant change in their role in social production and ways of obtaining public wealth. The problems of guaranteed work, social and everyday life related to achieving an acceptable level of well-being, health and confidence in the future have come to the fore.

In our opinion, the following classes (social communities) actually exist, which claim that they, being guided by their ideological attitudes, determine the face of modern Russian society.

First of all, it is the *ruling class* that possesses political and economic power in the country. This class is often called the elite, which, in our opinion, has no scientific and moral-ethical basis. By and large, it is focused on achieving those liberal values that are professed by the highest reaches of Western countries. They are joined by a cohort of service groups who, by word and deed, strive to prove loyalty to their masters. Many representatives of this class, especially the economic bloc, are closely connected with the West, where their wealth is stored and the banks they have created function. They often have the citizenship of these countries. It is clear that in many cases they are only nominal patriots of Russia, although they can make passionate statements, as well as the journalists of all stripes and colors who are in their pay. It is futile to expect that they will advocate for the state ideology. On the contrary, they react negatively to any regulatory role of the state, whether it is proposals for the introduction (revival) of strategic planning or the need for a state ideology. By the way, the official decision taken in 2018 on the implementation of strategic planning has not yet been implemented, because it is drowned in volumes of various developments, projects and recommendations. And the development of state ideology has been opposed by a set of long-known

spells: that it will be an attempt on democracy, on the suppression of human rights and freedoms, and even as a return of Stalinism. Therefore, most of them will not contribute to the normalization and necessary orientation of social consciousness.

There is another curious observation that I made when analyzing the oligarchs and their attendants. Most of these gatekeepers of business and power – inveterate liberals – virtually did not take part in real creative activity in the Soviet period. They did not work in production, practically never visited the Russian hinterland, had no business contacts with real participants in rough daily work, but they were regulars of metropolitan and chamber parties, all kinds of intrigues and claims to their specialness; they loved prestigious resorts and other places where they could get a pleasant rest. A smaller part of this group, although it was connected with production, was affected by another disease: they believed that in the Soviet Union they were not recognized as outstanding persons and were not promoted according to their "talent". Therefore, all of them – the former and the latter – found a different way to move up the career ladder, first within the framework of democratic movements in the Soviet Union and then in government and business structures in post-Soviet Russia. But obviously, this particular group, having dissociated itself from the "cursed Soviet past", has become a breeding ground for betrayal, corruption, and disregard for national interests. They have never represented and will not represent the interests of the people due to their careerist, purely personal selfish intentions.

Let me remind you of an interesting historical fact. When the first election to the State Duma was held in 1994, liberal figures represented by Gaidar's Democratic Choice of Russia party, being confident of their absolute victory, organized a live broadcast on television on the day of voting about the current election results. You could see the faces of the participants of the broadcast when the first messages, starting from the Far Eastern regions, shocked them: they were supported by an insignificant minority. At first, their comments were soothing – they said when it came to "real regions", everything would change. And then there was Krasnoyarsk on the air, and the results were the same there. And they decided to stop the show, because the shock paralyzed them – how come people did not support their wonderful ideas that they carried out in their politics? It was at this time that advocate of liberalism Yu. Karyakin exclaimed: "Russia, you have become stupid!" They could not understand and even imagine why people responded with downright ingratitude to their eagerness to make a difference and improve the life in Russia. In the future, the attitude toward liberal figures only worsened, they did not get into the State Duma. The result of their relationship with the people can be described in the words of the poet and writer Naum Korzhavin: "Liberals believed that the people should love them only because they are liberals. But it didn't work out. The people did not support them. And that's why liberals started calling them redneck".

All this points to the conclusion that the ruling class and its servants were not able and cannot express the main interests of social consciousness, and their ideology is a vestige of the fading historical past.

Speaking about the next social group, the so-called *middle class*, I can say it began to be used to name those people who had a guaranteed income that allowed them not only to meet basic needs, but also to claim additional benefits (bank accounts and securities, various types of housing, recreation, including abroad, payment for health preservation, providing their children with education abroad, etc.). However, it soon became clear that the middle class is very heterogeneous and its representatives have different opportunities to maintain their status and well-being. Therefore, supporters of this terminology have introduced strange and exotic names "upper middle", "mid-middle" and "lower

middle" layers of this class. As for attempts to define their worldview, the content and essence of their social consciousness and orientation in life, sociological studies have shown that they represent a kaleidoscope of beliefs that cannot be brought to a single denominator. And the well-being of this class, especially the so-called lower middle class, turned out to be in question, which led to a significant reduction in the number of its representatives first in the crisis of 2008–2009, then in the crisis of 2013–2014 and, finally, during the pandemic. In reality, the liberals' hopes that the middle class will form the backbone of the ruling regime, as is the case in the West, have not been implemented in Russia. In fact, this conclusion in Russia was not confirmed in any way – the middle class people were part of different political parties, a significant share of its representatives occupied a neutral position, which was especially evident by its (non) participation in most election campaigns.

One of the limited ideas about the middle class consists in an unsolvable question: what part of the population comprises this class. In the 2000s, some sociologists claimed that the middle class included up to 40–45% of the working population. According to RIA Novosti researchers, based on statistics from 2021–2022, only 11.5% of families belong to this class. Then a reasonable question arises: to what extent this class can express the social consciousness of the whole people and whether it can have a unified worldview, given its huge differentiation in income and different political orientations. And the definition itself is suggestive: according to researchers, the middle class is considered to be "working people with labor incomes that allow them to purchase expensive property (housing, cars), as well as having a relatively high level of current consumption" (at least two subsistence minimums per person after payment of mandatory taxes and loans (let me remind you that the average subsistence level in the Russian Federation since June 2022 is almost 14 thousand rubles per capita).

An attempt to consider the problem from the standpoint of the class division of society, which is based on grouping all people according to the principle of distributive (consumer) relations, does not help to find an answer to the question of who represents the Russian social consciousness. The ongoing attempts to characterize such social formations as bureaucracy, officialdom, power structures, business groups and others do not allow us to determine the role and place of each of them in terms of their impact on the stability of social consciousness, on their contribution to the formation of their own worldview.

A review of the currently prevailing ideas about the socio-class structure of Russian society and the main targets of classes still does not answer the question of WHO determines the essence and content of social consciousness in Russia and whose ideas, needs and interests should underlie the state ideology.

Who actually defines the face of modern Russian society?

To answer this question, in our opinion, it is necessary to consider the *social situation* of Russians and what *worldview orientations* exist in modern Russia.

As for the social situation, a more careful and thorough analysis of sociological data has led to the conclusion that the current socio-class structure of society is dominated by segments of the population, social communities and groups that exist in conditions of great uncertainty. Moreover, they consist not only of workers and peasants, but also employees, intellectuals, service sector workers and a number of other social niches. This uncertainty and instability of the social situation is due to the fact that, according to All-Russian studies conducted by the Russian State University for the Humanities in 2018–2022, a significant part of the population: a) do not have employment contracts (for example, up to 30% of all employed in construction and services); b) up to 10% has a limited term of

employment agreements (from 2–3 months to 1 year); c) have unstable wages, "envelope" wages, according to 28% of respondents; d) are deprived of social guarantees in whole or in part (there is no pay for vacation, sick leave, forced downtime, etc.; up to 40%); e) do not participate in solving the problems of their organization (up to 80–85%); f) do not see prospects in the future (up to 70%). In our opinion, the presence of these characteristics in the predominant part of the working population should be called the *precariat* (from Latin: unstable, non-guaranteed). Of course, these indicators of disorder and limitation relate to different socio-professional groups in different ways. Some workers have several named traits at the same time, while others have only one or two characteristics; this allows us to call them candidates for the precariat. However, in general, these layers and groups, according to various estimates, cover from 50 to 75% of the economically active population (Bobkov et al., 2018). It means that these communities and groups largely represent the face of the modern socio-class structure of Russian society.

But what are they?

To answer this question, it is necessary to know the reasons for the emergence of this class, how and in what way the groups of unstable and non-guaranteed labor were formed. In our opinion, they arose under the influence of two contradictory processes.

On the one hand, the developing economy requires continuous improvement of technological processes, which often radically change the production algorithm, meaning and principles of professional activity of the worker. And this, in turn, requires the restructuring and flexibility of the recruitment and use of labor, the involvement of specialists of a different profile and other qualifications and/or the retraining of the workforce. In such circumstances, the employer was often not interested in hiring workforce on a permanent basis. Objective conditions of the constantly improving technological processes prompted the employer to resort to limited, short-term, temporary use of labor, which has become a characteristic feature of large enterprises (organizations) and medium and small businesses.

On the other hand, this objective need entails huge social costs, infringement of the rights and guarantees of employees: they are fired, transferred to a reduced working day; their wages are cut; they do not have a guaranteed paid vacation and sick leave. And most importantly – in fact, they are thrown to the mercy of fate. In real life, the principle so beloved by our liberals began to prevail: a person is responsible for their own life, and if they do not know how to get settled in it, let them blame themselves. At the same time, the employer and the state do not spend much effort to help such employees to get settled in life again, preserve and/or modernize their professional potential and social ties. But these people, who mostly have educational and professional potential, want to be useful to society, to maintain the previously achieved standard of living and quality of life, to have guarantees for their personal well-being and that of their children.

But since they form the relative majority of the country's population, its face, it is they who determine the essence and content of social consciousness. Thus, we will take the next step and analyze the current worldview of the working Russian population *(Table)*.

According to the analysis of the data, there are many ideological orientations in political and spiritual life in modern Russia. Two orientations, socialist and national-patriotic, prevail. These figures correlate with the approximate number of people we have described as the precariat. Moreover, in the real consciousness of people, these two orientations are often difficult to separate. As for the socialist orientation, it is obvious that even 30 years after the defeat of the Soviet Union, despite the crisis of the ideas of socialism and communism,

What are your political views? (%)

Views	Year			Sector					
	2018	2019	2022	Construction	Transport	Trade, consumer services	Industry	Agriculture	Science
Left (socialist, communist)	22.5	25.2	24.3	27.7	26.3	21.7	20.0	28.0	21.0
Right-wing (liberal)	14.5	14.9	16.6	13.7	18.0	13.0	23.0	13.7	28.0
Patriotic, national	36.8	24.2	32.5	26.0	26.3	20.3	29.7	18.7	29.0
Monarchical	1.2	1.2	1.3	0.7	2.3	0.7	1.7	1.0	2.0
Religious (Christian, Muslim, etc.)	5.0	9.1	7.3	8.3	6.3	12.7	4.7	11.7	2.0
Others (please, name what)	1.5	–	1.8	-	–	–	13.7	11.3	13.0
I don't have any	18.6	18.9	-	18.3	15.7	22.7	–	–	–
Did not answer	–	6.4	16.3	5.3	5.0	9.0	7.3	15.7	5.0

Source: All-Russian sociological surveys conducted in 2018–2020 in six sectors of the national economy and culture by sociologists of the Russian State University for the Humanities and the Center for Social Forecasting and Marketing (for more information, see: Toshchenko Zh.T. (Ed.). (2020). *Prekariat: stanovlenie novogo klassa* [The Precariat: the Formation of a New Class: Collective Monograph]. Moscow: Tsentr sotsial'nogo prognozirovaniya i marketinga.; Toshchenko Zh.T. (Ed.). (2021). *Prekarnaya zanyatost': istoki, kriterii, osobennosti* [Precarious Employment: Origins, Criteria, Features: Collective Monograph]. Moscow: Ves' mir.).

a socialist worldview continues to exist in modern Russia. This ideology is still there; moreover, it tends to be further preserved and spread even more widely. It continues to exist, as it embodies a century-old and even a thousand-year-old dream of a just state, as the Soviet Union, with all the ups and down of its development, was in the minds of these population groups.

National-patriotic views currently represent a number of rather diverse socio-political orientations – from the ideas of traditionalism, the values of previous generations to various kinds of social-democratic and moral-ethical attitudes. In one way or another, they all advocate the preservation of historical and national-cultural values, their multiplication, fostering loyalty to the country, supporting traditions and customs in the lives of modern citizens, considering them a binding and moral force. However, we should recognize that those who fled abroad with the huge amounts of money they had stolen from their own country, and those who live in the criminal world, and those who are ready to join this ideology for the sake of receiving various dividends – all of them don the clothes of patriots. However, representatives of these groups are unlikely to be included in the sample of specific studies, so we can conclude that this group is dominated by people who embody the civic qualities of loyalty and devotion to their country, its culture and lifestyle.

We should note that the social foundation of socialist and national-patriotic ideas has changed: industrial workers, peasants, intellectuals, service sector workers – neither of them represent something unified and homogeneous. They are fragmented; they work in various socio-economic conditions mediated by various forms of ownership. In our opinion, the social base of leftist and national-patriotic orientations and ideas is made up of precarious strata, which include large social groups living in a state of uncertainty about the stability of their current and future situation. It is these groups that are interested in the realization of socialist and patriotic ideas, which they consider the personification of a just society. Representatives of these groups do not oppose the existence of private forms of ownership; they advocate the establishment of social (but not leveling off) equality and, as a desired goal, social justice.

If we look at the data in the table, we see quite limited and even insignificant support for liberal ideas. It is noteworthy that the liberal ideology, although aimed at such externally attractive values as the development of democracy and ensuring human rights, implies a focus on turning the state into a "night watchman", on the absolute, unconditional responsibility of each person for choosing their life path and competitiveness for survival in the present-day reality. Moreover, it is openly proclaimed, for example, by V. Inozemtsev (2011), that the "new inequality" cannot be considered unfair, since it is based not on coercion, but on the result of the actions of creative personalities.

It is revealing that the social foundation of liberalism has significantly decreased over the years of existence of the new Russia. The people rejected the right-wing parties in their desire to seize legislative and representative bodies of power. Both former and existing leaders of liberalism, starting with E. Gaidar, have been debunked in public opinion. However, despite the lack of popular support, the economic ideas of liberalism remain at the state level. It was their existence and continued implementation at the official level that led (along with other factors) to the stagnation of Russia's socio-economic development, the growth of social inequality, an increase in social tension, and the formation of the trauma society.

The limitations and even futility of the ideas of liberalism became obvious to the RF President when, in an interview with *The Financial Times* newspaper in June 2019, the role and importance of liberalism in the life of the whole world and individual countries was assessed as low. Moreover, the President emphasized that the problem is not so much that liberals and their ideas exist, but that "they aggressively impose their point of view on the overwhelming majority".

The analysis of the social situation and worldview of Russians shows that it is their needs, value orientations and interests that the state should proceed from when building economic and social policy. This is all the more important because, as sociological data show, most representatives of the precariat are proponents of a strong state; they advocate for strengthening Russian society and want to participate in its improvement.

And while such orientations and attitudes prevail in the social consciousness, the state ideology should be built precisely on these grounds that actually pursue such social and personal goals as the establishment of social justice, the possibility of a sustainable level of well-being and respect for human dignity. Otherwise, the state, represented by the precarious strata that constitute *a significant mass of the able-bodied population,* loses support from the *intellectual strata of society, owners of huge labor and creative potential, owners of educational and professional capital*.

Social significance of social consciousness

Speaking about the importance of the orientation of the state toward social consciousness, I would like to recall the following: the Bolsheviks won in October 1917 not as a result of a conspiracy, as liberal authors write, and not as a result of the Bolsheviks' deceit or cunning, but as a result of the fact that the only party – the Bolshevik party – advocated what the majority of the people wanted: peace, factories to workers, land to peasants. That is why the Bolsheviks were supported during the civil war and foreign intervention; the people were inspired by plans for the reconstruction of society, from the electrification of the country and elimination of illiteracy to five-year plans for the development of the national economy. The fact that this course was correct was confirmed by the heroic and tragic experience of the Great Patriotic War. In this regard, taking into account and understanding the basic attitudes and orientations of social consciousness have been and will be the key to the existence of the corresponding political system and its ideology.

That is why the modern state ideology should be based not on some abstract wishes expressed by some wise person from above or from the outside, but on what the majority of the people want and strive for, and, of course, take into account the interests of other social classes and groups. That is, I emphasize, we need to decide on the main actor of the historical process, to know what is happening in its mind, and to build state policy accordingly.

I have written an article titled "The People Are Always Right, Even When They Are Wrong" (Toshchenko, 2020). Thus I wanted to express that one cannot ignore the orientations and attitudes prevailing among the people, even if they do not coincide or are at variance with the conclusions of the ruling strata who would like to lead the people to their goals. In such a situation, the urgent question is to understand why and for what reasons the people have different needs and interests. And only then will it become clear what has to be done in order to adjust the policy and actually ensure the existence of a social contract with the people.

In my opinion, the second reason pointed out by S.Yu. Glazyev – the monetary and financial front – in addition to the purely banking and financial characteristics has the most direct relation to the consciousness and the corresponding ideology. At the front, where liberal-oriented figures predominate, an economic policy is professed and pursued that is fully oriented toward the implementation of ideological attitudes that take into account the interests of only this group rather than the majority of people. And, judging by their real behavior, they are trying to carry out their goals one way or another, by ignoring and manipulating, to force people to agree with their projects and plans. But in conditions when the precarious strata continue to increase, including at the expense of the middle class, it becomes increasingly obvious that without taking into account their needs and interests, it is impossible to achieve success in ensuring genuine economic, political, social and cultural independence. The economic policy carried out by the liberals in power and expressed in purely special terminology still remains an instrument of the struggle for the consciousness, for the imposed ideology.

In conclusion, we can say that the situation after February 24 highlighted the confrontation of various ideological orientations and attitudes, more specifically and clearly showing whose interests are reflected by the opponents and supporters of the ongoing special military operation. At the same time, attention should be paid to the fact that the majority of the people – almost 80% – support this action, while a relatively small group, especially those who have fled abroad (who have the means to live there), is a loud and narcissistic mass following the path of confrontation with the abandoned homeland.

All this ultimately allows us to draw the following conclusion: since the main features of social consciousness are represented by the majority of the people who have the features of a precarious social position, they should be taken into account to the maximum extent in the state policy and its ideology.

References

Anisimov R.I. (2017). Labor in the uncertainty epoch. *Sotsiologicheskie issledovaniya=Sociological Studies,* 11, 44–52 (in Russian).

Bashkatova A. (2022). The Russian middle class had to be searched for with a magnifying glass of statistics. *Nezavisimaya gazeta*. July 26.

Bobkov V.N., Kvachev V.G., Kolmakov I.B. et al. (2018). *Neustoichivaya zanyatost' v Rossiiskoi Federatsii: teoriya i metodologiya vyyavleniya, otsenivanie i vektor sokrashcheniya* [Precarious Employment in the Russian Federation: Theory and Methodology of Identification, Assessment and a Vector of Reduction]. Moscow: KnoRus.

Golenkova Z.T., Goliusova Yu.V. (2015). The precariat as a new phenomenon in the modern social structure. In: *Naemnyi rabotnik v sovremennoi Rossii* [Hired Worker in Modern Russia]. Moscow: Novyi Khronograf (in Russian).

Gorshkov M.K., Sheregi F.E. (2020). *Molodezh' Rossii v zerkale sotsiologii. K itogam mnogoletnikh issledovanii* [The Youth of Russia in the Mirror of Sociology. To the Results of Long-Term Research]. Moscow: FNISTs RAN.

Inozemtsev V. (2011). The crisis of the Great Idea. *Svobodnaya mysl'*, 1, 17–28 (in Russian).

Levashov V.K. (2020). *Rossiiskoe gosudarstvo i obshchestvo v period liberal'nykh reform* [The Russian State and Society in the Period of Liberal Reforms].Second edition. Moscow: Yurait.

Popov A.V., Solov'eva T.S. (2019). Analyzing and classifying the implications of employment precarization: Individual, organizational and social levels. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 12(6), 182–196 (in Russian).

Shkaratan O.I., Karacharovskii V.V., Gasyukova E.N. (2015). Precariat: Theory and empirical analysis (polls in Russia, 1994–2013 data). *Sotsiologicheskie issledovaniya=Sociological Studies,* 12, 99–110 (in Russian).

Skvortsov N.G., Karapetyan R.V. (Eds.). (2021).*Transformatsiya truda v (de)globaliziruyushchemsya obshchestve: sbornik nauchnykh statei* [Transformation of Labor in a (De)globalizing Society: Collection of Scientific Articles]. Saint Petersburg: Skifiya-print.

Standing G. (2014). *Prekariat: novyi opasnyi klass* [The Precariat. The New Dangerous Class]. Moscow: Ad Marginem.

Toshchenko Zh.T. (2018). *Prekariat: ot protoklassa k novomu klassu* [The Precariat: From the Proto-Class to a New Class]. Moscow: Nauka.

Toshchenko Zh.T. (2020). The people are always right, even when they are wrong. *Mir peremen=The World of Transformations,* 2, 171–179 (in Russian).

Toshchenko Zh.T. (Ed.). (2020). *Prekariat: stanovlenie novogo klassa* [The Precariat: the Formation of a New Class: Collective Monograph]. Moscow: Tsentr sotsial'nogo prognozirovaniya i marketinga.

Toshchenko Zh.T. (Ed.). (2021). *Prekarnaya zanyatost': istoki, kriterii, osobennosti* [Precarious Employment: Origins, Criteria, Features: Collective Monograph]. Moscow: Ves' mir.

Information about the Author

Zhan T. Toshchenko – RAS Corresponding Member, Scientific Director of the Faculty of Sociology, Russian State University for the Humanities (6, Miusskaya Square, Moscow, 125047, Russian Federation); Chief Researcher, Institute of Sociology – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (24/35, building 5, Krzhizhanovsky Street, Moscow, 117218, Russian Federation; e-mail: zhantosch@mail.ru)

Received August 9, 2022.

DOI: 10.15838/esc.2022.4.82.3
UDC 316, LBC 60.5

Russia in the Epicenter of Geopolitical Turbulence: Accumulation of Global Contradictions

Evgeny V. BALATSKY
Financial University under the Government of the Russian Federation
Central Economics and Mathematics Institute, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: evbalatsky@inbox.ru
ORCID: 0000-0002-3371-2229; ResearcherID: D-8752-2018

Abstract. The article examines the situation of Russia falling into the epicenter of geopolitical shifts in 2022, when the country found itself involved in the hybrid warfare with the Collective West. The novelty of our approach consists in reconstructing key events of the geopolitical competition of the last 15–20 years with the use of an extensive range of related concepts from various fields: economics (Trout's mistake, neocolonialism), cybernetics (Ashby's Law and Sedov's Law), management (external management, hybrid warfare), synergetics (synergetic effect, system complexity), political science (security, freedom, power structure), political economy (Arrighi's cycles of capital accumulation, global capital center, rate of return), institutionalism (shifting risks from the physical world to the social world), geography (horizontal diffusion of innovations), psychology (war of meanings, war of nerves). This made it possible to bring together many poorly compatible phenomena of different nature, synthesize the concepts used and reveal the logic behind the struggle of geopolitical players for world hegemony. To deepen the analysis, we provide our own typology of world wars and their characteristics. We prove that the special military operation in Ukraine exposed the impasse of Russia's economic policy and consolidated other countries in a hybrid war against the United States, thereby becoming a key event in history and giving rise to a global geopolitical confrontation between the West and the Non-West. Our main conclusion is that Russia has objectively found itself in the epicenter of geopolitical turbulence, and, consequently, cannot avoid a direct collision with the Collective West; therefore, over the next 15–20 years the country will have to go through all the stages of a new hybrid world war.

Key words: geopolitical turbulence, world capital center, competition, war, world economic system.

For citation: Balatsky E.V. (2022). Russia in the epicenter of geopolitical turbulence: Accumulation of global contradictions. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 42–59. DOI: 10.15838/esc.2022.4.82.3

Acknowledgment

The article was prepared within the state assignment of the RF Government to the Financial University for 2022 on the topic "Socio-economic development in the era of fundamental transformation of systems".

Introduction

In 2022, contradictions that had accumulated between the Collective West and Russia, as well as within the Russian Federation itself, boiled over into Russia's special military operation (SMO) in Ukraine. Today it is already clear that the SMO is not a confrontation between the two states – Russia and Ukraine, but the break-up of a consensus on previous agreements on the division of the world. In this regard, the military conflict has served as a kind of trigger for curtailing globalization and establishing regional geopolitical blocs of countries. It is quite obvious that the scale of the forces that have come into motion will lead to a revision of the former world order and formation of a new geopolitical configuration. At the same time, many aspects of the ongoing shifts are not yet fully clear and difficult to understand because the world system is entering a transitional stage that is commonly called the regime of *global turbulence* and that is characterized by the instability of many processes and the unfinished nature of all social mechanisms of interaction between participants in the global political market.

The SMO, a major event of the last decades, has exposed many hidden strategies of the West, Russia and other global players in the global political space; this urges us to reconsider a large segment of world history and produce new social knowledge capable of explaining the events of the present and future on a systems basis. This task goes beyond the scope of social science alone, and we implement it in the series of three papers. In this article, which is the first one in the series, we consider the period from 1945 to 2022, during which the contradictions of the post-war system of the world order were gradually accumulating. Our approach consists not only in a new interpretation of the events and processes under consideration, but also a new explanation of the causes of their occurrence and the logic of their course.

World wars: a new chronology and reconstruction of events

Russia in its various forms – the Russian Empire, the USSR or the current Russian Federation – has been one of the main players in the global geopolitical space (GGPS) for the last 200 years at least. It is not surprising that in 2022, through the SMO, it was Russia that initiated de-globalization of the GGPS (Ilyin, Morev, 2022). Let us consider the genesis of this event.

The traditional chronology and understanding of world wars is as follows: the First World War took place in 1914–1918, the Second World War in 1939–1945. From that moment on, humanity has been anxiously waiting for the Third World War. However, at present there are two premises that are becoming increasingly important and allow us to look at the world in a different way. The first one is that war never comes to an end, and therefore "the history of all hitherto existing societies has been the history of wars and military art" (Devyatov, 2020a, p. 11). The second premise is connected with the evolution of the phenomenon of war itself, namely with the final crystallization of its new form – hybrid war (Komleva, 2017). Today, the hybrid war is a *war of meanings and nerves* and aims to "stupefy the national elites and desecrate (dehumanize) the masses" (Devyatov, 2020b, p. 83). Accordingly, the task of the *war of meanings* is to destroy the culture of the enemy people – their traditional outlook, ethical and aesthetic coordinates, values, faith and other elements of the worldview. The task

of the *war of nerves* is to get the fastest and most accurate reaction of their forces to control signals and, conversely, to slow down the enemy's reaction by means of apathy or exhausting destructive excitement (Devyatov, 2020b, p. 159). Hybrid war is informational in its essence, its "blows" are embedded in the national economy and culture, violating their original format and the direction of their evolution.

If these conceptual provisions are not taken into account, then it becomes almost impossible to adequately describe the post-war development of the world. If we accept these clarifications, we will get the following chronology of world wars: 1914–1918 – the First World War (hot); 1939–1945 – the Second World War (hot); 1945–1991 – the Third World War (cold); 2014 – present day – the Fourth World War (hybrid). The *Table* shows the features of these four world wars, followed by certain comments.

First, the First and Second world wars were *hot* wars, i.e. their goal was to physically destroy the enemy – its manpower and infrastructure. At the same time, the level of technological development of mankind in the First World War did not yet allow for the total destruction of the enemy, whereas in the Second World War, which ended with the test of an atomic bomb, it was already possible. After the United States of America tested an atomic bomb, the Third World War began almost immediately when the confrontation between the established two centers of power – the United States and the USSR – was global, because it covered the world capitalist and socialist systems and took the form of a military-technological competition. The objectives of this period were to create more advanced weapons of mass destruction and discredit the very essence of the enemy's social system. This implied a *war for the minds* of the population of the enemy country and inflicting maximum damage on its economy. That is why we can talk about the *hybrid nature* of the Third World War, which was limited in terms of the scale of the confrontation due to the limited capabilities of information systems of that time.

Second, during the Third World War, its important feature was revealed – it is not officially declared by anyone, but its end, just like in an ordinary hot war, is marked by the victory of one side and the defeat of the other, with all the consequences that follow. This is exactly what happened in 1991, when the Soviet Union, represented by its leadership, admitted defeat in the Cold War and was subjected to post-war reparations in a new and modified form that, however, does not alter their essence. We will discuss this aspect in more detail in the next section.

Third, the four known world wars make up two evolutionary stages of world history – hot and cold (hybrid). The contradictions accumulated in the world capitalist system by 1914 required a radical change in the world order, which could not be done through the First World War, and therefore demanded its recurrence in 1939. In 1945, there was an actual dramatic change in the world order; two global centers of power emerged, the United States and the USSR; and when after 1949 they acquired advanced nuclear forces of mass destruction, hot wars became ineffective and meaningless. However, the main transformational result of the two hot wars was achieved – the "irritation factor" represented

Features of world wars

Name	Period	Nature	Type
First World War	1914–1918	Hot (armed)	Limited
Second World War	1939–1945		Total
Third World War	1945–1991	Hybrid (cold)	Limited
Fourth World War	2014 – present		Total
Source: own elaboration.			

by Germany was suppressed, and the center of the world shifted from Eurasia (Eastern Hemisphere) to North America (Western Hemisphere), which marked a qualitatively new order in the GGPS.

Fourth, the duration of world wars is increasing, especially the duration of hybrid wars. So, the First World War lasted four years, the Second – six years, and the Third – 46 years. There are grounds to assume that the Fourth World War, which has been going on for eight years already, will drag on for another 15–20 years. Such changes in the duration of the wars are due to non-violent and indirect clashes of competing states. The "war of minds" and the "war for minds", which constitute the essence of hybrid wars, are conducted by peaceful means in the technological and information space; as for local hot conflicts, they have an indirect form and arise, as a rule, in third countries. In this regard, the SMO is a classic manifestation of a *proxy war* – since 2014, the United States has been preparing Ukraine for a hot war with Russia by inciting nationalist feelings of the Ukrainian population and misinforming the world community about the true events in the region.

Fifth, the U.S. victory in the Third World War was not final, just as the results of the First World War were not satisfactory. While Germany lost the First World War, but remained a major political actor in Eurasia – the circumstance requiring Germany to be "finished off" during the Second World War, then after the Third World War, the USSR lost, but remained – in the form of the Russian Federation – a formidable force in the GGPS; ultimately, this became clear after the 2014 accession of Crimea to the Russian Federation, when the country demonstrated the possibility of restoring its former power. This led to the escalation of military actions by the Collective West for the final "elimination" of the Russian factor in world politics; this move was embodied in the undeclared Fourth World War, which began in the form of local hot clashes on the territory of Ukraine in 2014. From 2022, the hybrid war became total and absolutely uncompromising. From the point of view of the Collective West led by the United States, this war can only end with the complete destruction of the cultural identity of Russia and the peoples living on its territory, after which an absolute hegemony of Western ideology will be established.

The latter premise needs some explanation. Thus, according to Samuel Huntington, after the collapse of the Soviet Union in 1991, the confrontation of global ideologies disappeared, and instead there should come a war of civilizations as some isolated and irreconcilable communities with different cultural and religious foundations (Huntington, 2021). However, today the fallacy of this concept has become quite obvious. Huntington spoke about the ideological opposition Capitalism/Communism; however, today it has become clear that the division runs along a different border – West/Non-West. That is why, after the introduction of unprecedented international sanctions against Russia in 2022 by the collective West, a Non-Western alliance of Islamic Iran, Sinic China and Orthodox Russia was formed. Thus, the ideological confrontation remained, but now it was different from the dimension it had assumed after the Second World War. In public discourse, it sometimes appears in a wide variety of pairs of oppositions – Globalists/Nationalists, Democrats/Siloviki, Liberals/Narodniks, etc. Consequently, the Fourth World War should lead either to the final victory of the Western worldview globally, which will automatically make the world institutionally and culturally more homogeneous than it has ever been before, or to the victory of the idea of national identity with ongoing contradictions and local wars, but on a different technological basis. This dichotomy has a geopolitical tone – the further evolution of world civilization will be determined either in the New World (in North America and the Western Hemisphere), or still in the Old World (in Eurasia and the Eastern Hemisphere). In this

regard, we should mention that back in the late 1940s Arnold Toynbee wrote about the "unification of the world" in the course of social evolution (Toynbee, 2011, p. 66).

The all-encompassing nature of the current Fourth World War is manifested in the dominance of the West in the information sphere and in the full-fledged use of this advantage against Russia. In fact, all information channels controlled by the West have turned to outright falsification of facts; this, however, does not reduce the strength and effectiveness of this weapon of mass destruction used against the consciousness of the masses. The intrigue of the global clash is how quickly and effectively the countries of the Non-Western bloc will be able to organize resistance on the information front. Let us recall two important facts in this regard: the Soviet Union, inferior to Germany in military technology at the beginning of World War II, surpassed it at the end of the war; China has already taken control of the information space today: it cuts short the unwanted signals from the West and thereby preserves its own ideological integrity and cultural identity. This clearly indicates that further events are unpredictable, which constitutes the intrigue of the modern historical moment.

World wars, Trout's mistake and the phenomenon of neocolonialism

After the end of the Second World War in 1945, there was an unspoken consensus in the world regarding the punishment of the defeated countries. Already by the middle of the 20th century, a phenomenon called *Trout's mistake* began to manifest itself in the GGPS: in the context of global competition, any serious mistake made by the actor becomes fatal (Balatsky, 2011). We recall that, according to Jack Trout, companies that achieved success in the mid-20th century functioned, as a matter of fact, in greenhouse conditions, making a lot of mistakes and quickly correcting them; in the 21st century any business mistake becomes fatal – the market punishes it most severely, causing the ruin and closure of the company (Trout, 2009, pp. 12–13).

As it turned out, on a national scale, Trout's mistake fully manifested itself already by the mid-20th century. At the state level, the Trout effect can be formulated as follows: *to a country that was defeated in a world war, this event becomes fatal, because this country is forever deprived of the right to political sovereignty*. This provision is true, first of all, in relation to the countries that lost the Second World War. Let us look at the fate of Germany after 1945: it was divided into two parts, one of which came under the patronage of the United States, and the other – the USSR. From that moment on, Germany's political sovereignty was lost virtually forever – until now. Moreover, the identity of Germans, if not completely suppressed, was greatly leveled through the education their youth got that instilled in them a sense of guilt for the atrocities committed by their ancestors. And neither the restoration of Germany's unity in 1990, nor the collapse of the USSR in 1991 brought back its political sovereignty: today, its territory is covered by a network of U.S. military bases, and its economy does not have strategically important industries like rocket engineering, civil aircraft construction, shipbuilding, and electronic industry that produces electronic circuit boards. Thus, the example of Germany shows that the defeated country is taken completely under the control of the victorious country that pursues a *policy of selective prohibition*, under which an unspoken veto is imposed on strategically important industries and activities. A similar policy was pursued with regard to Japan – two atomic bombs were dropped on it, the country itself went under the patronage of the United States, and the strategic functionality of its economy was also reduced; the youth educational policy in Japan has led to the fact that today a significant part of the Japanese population believes that it was the Soviet Union that dropped atomic bombs on their country. A similar fate befell Korea, which was

divided into communist North Korea and capitalist South Korea; the U.S. tried to implement a similar scenario in Vietnam. In post-war China, as a result of the 1945–1950 civil war and the victory of the Communist Party, Taiwan was autonomized and fell under the patronage of the United States.

Let us now consider in more detail the policy of fragmenting the defeated countries, which originates in the ancient Roman "divide and rule" principle. The effectiveness of this approach for a winner country has already been confirmed both theoretically and empirically. Thus, theoretically, making a defeated state weaker by fragmenting its territory means destroying the *synergetic effect* by severing the ties between its individual fragments (parts); it is illustrated mathematically by the disappearance of the systemic effect in the balance ratio of the country's potential. Empirically, it has been proven on the example of the former republics of the USSR, where after 1991 for 31 years there was not a single case of significant economic achievements: depopulation developed in the splinter countries, foreign debt dependence grew, military conflicts erupted, etc. (Gusev et al., 2022).

The above indicates that after the Second World War the phenomenon of colonialism was revived in a modified form – the defeated countries were divided into parts which were deprived of political sovereignty and de facto fell under the *external control* of the victorious country without a statute of limitations, i.e. virtually forever. It is the very system of post-war *neocolonialism*, when the state defeated in the war was deprived of chances for further full-fledged development.

In the context of what has been said, we find it appropriate to recall that the practice of banning the development of a competitor state has always been one of the main ways of geopolitical confrontation and maintaining order, beneficial to the hegemon country. Thus, according to Daniel Arnaud, already in the first millennium BC the Assyrians considered it unacceptable that states should be formed on the territory of hostile tribes: if intelligence informed them of such a threat, a military expedition was sent to the neighboring territory and devastated it to such an extent that any state formation there became impossible for centuries (Arno, 2009, p. 29). Essentially, nothing changed in the 20th century: the means for maintaining a geopolitical monopoly have been only slightly modified.

The above explains the essence of the metamorphoses of the USSR after 1991. The Soviet Union lost the Third World War, admitted defeat and signed an act of surrender in 1991 in the form of the Belavezha Accords, according to which Russia, Belarus and Ukraine recognized the fact of the termination of the existence of the USSR as a subject of international law and geopolitical reality. After that, the country was divided into 15 "independent" splinter countries, each of which, with the exception of Belarus, came under direct external control (Volkonsky, 2021). It was organized through *networks of Western emissaries* created in the splinter countries and covering national governments. Emissaries, as was done at all times in the comprador power elites, were recruited from citizens of the splinter countries, who, as a rule, were trained and interned in the West and later placed in key government posts. Subsequently, Western emissaries adopted state decisions based on the policy of selective prohibition in coordination with the center represented by authorized persons from the United States. Thus, all the splinter countries were successfully drawn into the orbit of U.S. political interests.

The post-Soviet space was reorganized in such a way that all the nuclear forces of the USSR were localized in Russia. Thus, the rest of the countries turned out to be de facto defenseless and unable to defend their political sovereignty. The only exception was the Russian Federation, which after the collapse of the Union remained the only risk factor in the region and therefore continued to remain under the close attention of the West,

whose goal was to further divide the country into several (or many) small states with their final demilitarization. This motive – final destruction of a potential competitor – became the dominant one for the U.S. administration for the next 32 years. The West achieved great success on this path during Boris Yeltsin's presidency, when the country was deprived of high-tech industries and advanced science and education, after which it found itself on the verge of further fragmentation. However, the *logic of self-organization* of a large nation slowed down this process. In the most general terms, this is what followed next. Representatives of the Russian security services, anticipating their own extermination as a class if the course of Boris Yeltsin were to be maintained, organized opposition to the emissaries of the West. As a result, in 2000, the post of the RF President was occupied by Vladimir Putin as a consensual figure; the choice did not completely suit either the security forces or the globalists, but it did not provoke utter rejection on their part. From this moment begins a long period of balancing the interests of the two centers of forces, which have received different names – Siloviki/Liberals, Nationalists/Globalists, etc.; the political balance was partially disrupted in 2014, when a conflict in the field of military security was resolved by the accession of Crimea to Russia.

Prior to the period stated above, the neocolonial policy of selective prohibition proved highly effective. The proof is found in many facts that contradict economic logic: the inability of a country that had the most advanced civil aircraft 10–15 years ago to restore this production to a decent level; chronic failures in establishing the production of electronic chips, which Taiwan, South Korea and China did from scratch almost at the same time, etc. This is due to the fact that the policy of selective prohibition pursued against Russia by the Western emissaries is initially based on the principle of destruction rather than creation; this simplifies public administration to the limit: what you should do is not *force* people to do something extraordinary (which is very difficult (!)), but *forbid* them to do it (which is very simple (!)). In other words, the entire Russian system of public administration for 23 years has encouraged not the rise of the domestic economy, but its degradation. It is not surprising that this state of affairs led to a colossal increase in social discontent and tension in almost all segments of the Russian population; sooner or later such a situation had to come into the open. This protest in 2014 took the form of a peaceful integration of Crimea into the Russian state; this triggered the Fourth World War and urged the West to become even more active in facilitating the collapse of the Russian Federation; in 2022, this conflict turned into a hot form on the territory of Ukraine.

A classic illustration of how neocolonialism works can be found in the description by Leonid Shebarshin, former head of the First Main Directorate of the KGB of the USSR, of a conversation with the Minister of Natural Resources of Pakistan, and later with Zulfikar Ali, Minister of Foreign Affairs, in 1961: "America that has been holding Pakistan with a stranglehold of military and food aid ..., that has established its bases here with weapons aimed at the Soviet Union, America that has been bribing the Pakistani bureaucracy and military..." "It was from a U.S. base in Badaber, Pakistan, that the infamous U-2 spy plane piloted by Powers recently took off. The plane was shot down over the Soviet Union and an unprecedented international scandal broke out..." (Shebarshin, 2017, p. 40). "Many high posts in Pakistan are held by American paid agents who spy on [Field Marshal] Ayub Khan's every move, who control all the actions of the government" and interfere with its attempts to "establish good-neighborly relations with India" (Shebarshin, 2017, p. 41). After 1991, this template of neocolonialism was applied to Russia without any alterations.

The above leads to the conclusion that the history of sovereign Russia, strictly speaking, begins

on February 24, 2022 when the special military operation was launched; only at that moment the supreme power of the country in its principled decisions was able to finally free itself from the influence of the West. Until that date, the Russian Federation has been a new resource-supplying colony of the West. The tragedy of neocolonialism for Russia is that this fate befell it when most of the former colonies not only won their sovereignty, but also began to claim the role of leaders. For example, A. Toynbee back in 1947 in search of a "third great power" capable of balancing the situation of confrontation between the U.S.A and the USSR, said that it was "certainly not in China or India; for, in spite of their ancient civilizations and their vast populations, territories, and resources, these two mammoths are most unlikely to prove able to exert their latent strength during the critical period of history that lies, we may guess, immediately ahead of us" (Toynbee, 2011, p. 136). The critical period of history, estimated at 75 years, has passed, and India, China, Iran and Pakistan have overcome the burden of neocolonialism and gained the long-awaited sovereignty, and with it the necessary military and economic power. That is why these four countries ignore the calls of the United States to impose sanctions against Russia; instead they continue to cooperate with it, persistently pursuing their own interests.

It should be noted that these countries have been striving hard and for a long time in order to gain independence. To realize how much effort they spent, let us turn again to the testimony of L. Shebarshin: "Careful thought, pragmatism with a fair amount of cynicism, strict consideration of state interests – all this constitutes the steel core of Indian politics, disguised by garlands of flowers, piles of philosophical treatises and fountains of high-flown rhetoric. The ability of Indians to achieve their goals cannot but inspire respect and even envy. They have a civilization of five thousand years behind them" (Shebarshin, 2017, p. 80).

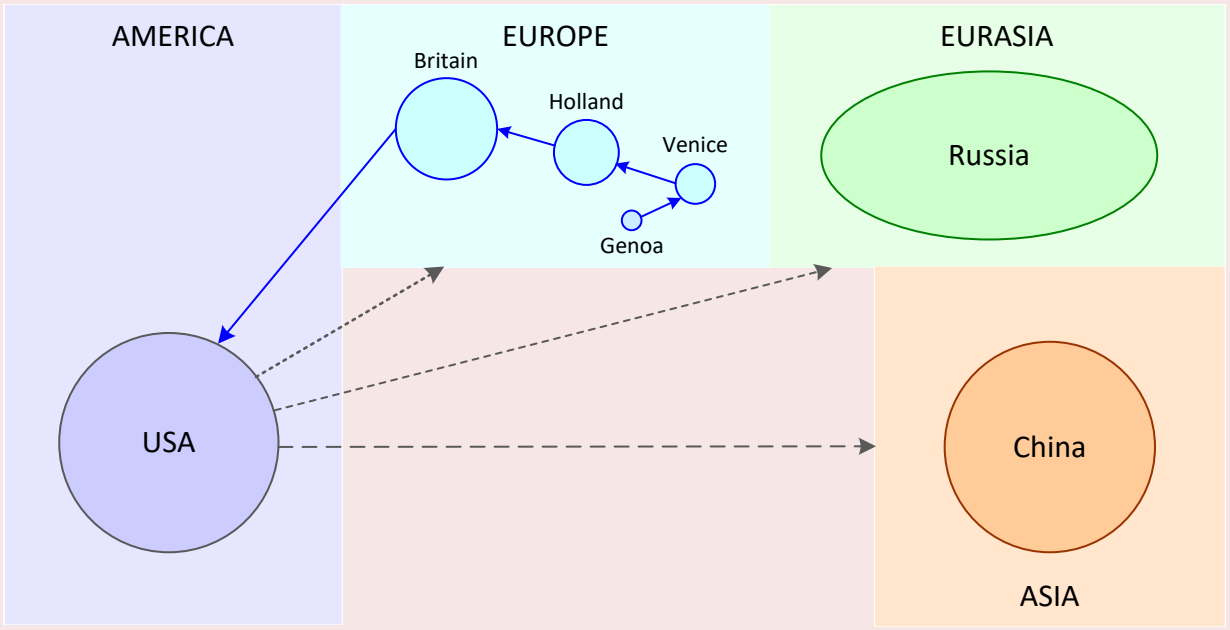
Let us draw some preliminary conclusions. The Second World War ended with the self-destruction of Europe: Germany ceased to be an "irritation factor", and the rest of the European countries did not possess the critical power to have an effective say in world politics. The center of power shifted to the Western Hemisphere, to the New World, to North America. The alternative center of power represented by the USSR had some features of the Eurasian civilization, and the very confrontation of the two centers took the form of military, technological and ideological confrontation of the colossuses. This antagonism and the Third (Cold) World War resulted in the defeat of the USSR and its radical weakening in the form of its main fragment – the Russian Federation. The inoffensiveness of Russia after 1991 was largely maintained through the system of neocolonialism, when, while being formally independent, the country was under external control and moved in an orbit of interests of the metropolitan country, the United States. However, internal processes in Russia aimed at gaining sovereignty led to a "political demarche" in 2014 by reintegrating Crimea, which provoked the Fourth (hybrid) World War. The 2022 special military operation finally made Russia "ungovernable" for the West; as a consequence, unprecedented international sanctions were introduced against Russia thanks to the complete "submission" of European countries (plus Japan) to the dictation of the United States. The greatest loyalty to the United States was demonstrated by Germany, which adopts decisions that are useful to the mother country, but harmful, if not murderous (!), to its own economy; this once again proves that Germany does not have political sovereignty after almost 80 years since its defeat in the world war of the 20th century. Trout's mistake, which leads corporations to economic death, has similarly led entire countries: Germany, Japan, Ukraine, etc. – to political death; now these are just cards to play in global politics.

As a counterbalance to the policy of economic ostracism of Russia, there unfolded a powerful "non-alignment movement" of Iran and China that have not joined Western sanctions and that have formed a triumvirate of allies: China – Russia – Iran, reinforced by India, Turkey and Saudi Arabia. The countries of the first group are the closest contenders for a geopolitical mopping up by the United States; this fact is what determines their position; the countries of the second group take advantage of the current unique situation to radically strengthen their international positions. The emerging configuration of geopolitical players creates an unstable equilibrium, which in itself indicates the end of the era of U.S. hegemony. Nevertheless, the latter is showing amazing persistence with regard to the elimination of Russia from the political arena; this needs a systematic explanation and will be considered in the next section.

Capital accumulation cycles, their significance and mechanism

The logic of the present-day geopolitical confrontation cannot be understood without Giovanni Arrighi's concept of accumulation cycles. According to this concept, in spite of the popular ideas about a multipolar world, the world capitalist system exists within the framework of a monocentric model, when there is a certain world capital accumulation center (WCAC) in which the rules of international relations are formed and from where the world system is managed. Throughout the observed history of capitalism, Genoa, Venice, the Netherlands, the UK and the USA have consistently acted as a WCAC (Arrighi, 2006). So, the country that has gained the status of WCAC acts as a management subsystem of the entire world economic system, while the latter acts as a managed subsystem. The WCAC forms tools, rules and norms of relations between economic agents, states and ordinary

Figure 1. Stylized diagram of the history of the movement of world capital accumulation centers



Source: own elaboration.

people. In the absence of a WCAC or in the presence of many competing centers, the order in the world system decreases and manifestations of chaos and disorganization increase. Schematically, the process of shifting the WCAC in time and space is shown in *Figure 1*.

In the last 3–4 decades, the United States has acted as a global "legislator" of economic relations, served as a center of attraction of capital, skilled personnel and cultural achievements. At the same time, the U.S. power was manifested in the fact that almost any controversial situation anywhere in the world was resolved by the political leadership of the country in favor of its national interests. We agree with G. Arrighi, who pointed out that the U.S. "internalized", i.e. took under its control, not only the defense and production functions of the state, but also the function of managing foreign markets (Arrighi, 2009a, p. 40). In other words, for the last 30–35 years, the United States has enjoyed a global political and economic monopoly.

However, over time, the next cycle of capital accumulation comes to its natural conclusion, and the political hegemony is to be transferred from the old WCAC to a new one, which "launches" a new cycle of accumulation. The period when the old WCAC is no longer coping with its "responsibilities" for managing the world system, and a new center has not yet fully taken shape and cannot yet take over the management of the world, is called the regime of geopolitical inversion or the regime of *global turbulence*. It is characterized by the instability of many processes and the unfinished nature of all social mechanisms of interaction between political actors in the global market, the intensification of competition between states, the emergence of numerous local military conflicts in a hot form. Currently, the world is going through this extremely unpleasant stage, when the U.S. hegemony is coming to an end, and no one can take its place yet. It is at this point that the key intrigue of world politics arises.

G. Arrighi himself pointed to the shift of the WCAC from the USA to Asia and mainly to China (Arrighi, 2009b, p. 40). However, an alternative WCAC represented by Russia was later considered, although doubts were expressed about the realization of its potentials (Balatsky, 2014). Currently, the situation is beginning to change dramatically and requires that all possible scenarios for the development of the global economic system should be given closer consideration; this uncertainty in the formation of a new WCAC is shown schematically in Figure 1. All the current actions of the United States confirm that their task is to prevent full-fledged development of three potential WCACs represented by a united Europe, Russia, and China.

Although the general disposition in the global political arena is clear, its details require clarification. To this end, Arrighi's concept should be supplemented with several important provisions, which we will discuss below.

First, the main driver of economic growth and social evolution in a capitalist society is not just profit, but the phenomenon of superprofit. This point has been proven both theoretically and empirically. For example, it follows from the basic equation of economic growth that its maintenance requires a "special" economic sector, in which the annual return on capital is calculated in three- and four-digit figures (in percentage terms) (Balatsky, 2021). The assessment of the profit margin of different types of businesses in different historical periods confirms this conclusion (Balatsky, Ekimova, 2020). The main thing is that the WCAC has always been the main recipient of the superprofit phenomenon: astronomical profitability was typical of the economies of the Netherlands and Great Britain during their hegemony, and today it is the common thing in the business of the U.S. At the same time, the phenomenon of superprofit and the WCAC go hand in hand: the WCAC, through a global monopoly on the most attractive areas of activity, secures superprofit for itself, and the

latter, in turn, allows the country to remain a world leader. Violation of this mechanism generates global disruptions in the life of the GGPS.

Today, the privileged position of the United States is maintained by a multitude of "unnatural" facts: the right to issue the U.S. dollar as a world currency that is virtually not backed by any commodity; control of global drug trafficking by U.S. security and intelligence agencies[1]; monopoly on high technology, etc. Only these circumstances can explain the well-known declaration of the Unites States that the life of an American is sacred: if there is a threat to the life of even one ordinary American citizen, even outside the country, the U.S. government sends an aircraft carrier to deal with the situation there. Although this slogan is largely a patriotic cliché, there has always been enough truth in it to think about the amount of revenue a state should have in order for it to be able to make such financial sacrifices. Thus it is clear that if there emerges a threat of destruction of the existing mechanism of the U.S. global monopoly, they will stop at nothing to prevent this. However, it is precisely such a threat that hangs over the United States today. This fact explains the intransigence with which the American establishment seeks the death of all its competitors.

Second, many facts suggest that a new WCAC can emerge on the territory of the Russian Federation. Russia's area is 1.8 times larger than the United States. If we assume that there might be even an informal reintegration of Russia, Belarus, Ukraine and Kazakhstan, then the index of territorial superiority of this association will be 2.2 times compared to the United States (Balatsky, 2014). In the context of a globalizing GGPS, such an advantage should be recognized as Russia's unique trump card, which no other country even dreams of possessing. If we add to the above the absolutely unprecedented endowment of the Russian Federation with valuable natural resources and its position between Europe and Asia, the two key regions of world trade, then it is natural to assume that a new center of world economic activity – the WCAC – may appear on its territory. Given the military power and the ability to take in huge masses of capital and labor resources with the historical experience of their "melting down" into the Russian World, Russia is becoming the most dangerous enemy of the United States; this fact proves the absolute uncompromising attitude of the latter toward the special military operation; even China does not have such valuable characteristics for becoming a WCAC. For the United States, superprofit and world hegemony are at stake, and Russia acts as the main claimant to these civilizational benefits. At the same time, the situation does not depend on either Russia or the United States, it is a kind of whim of Nature and Providence, and therefore neither one nor the other country can avoid collision, which ultimately determines their uncompromising confrontation.

Third, a new WCAC should implement a new management function, which, apparently, the United States can no longer do. For example, Arrighi believed that this new property should be the ability of the WCAC to reproduce (Arrighi, 2009a, p. 39). The arrival of Donald Trump as the U.S. President actually meant an attempt to "restart" the cycle of capital accumulation within the jurisdiction of the old WCAC and thereby preserve its hegemony. However, this scenario failed; therefore, the center will continue to shift to another region. We can say that the United States can no longer rule the world in the old way, and they do not want to do it in a new way.

Important explanations should be made in this section. The fact is that the *cycle of capital accumulation* should also be interpreted as a *management cycle*. At the time when a new WCAC

[1] There are many works on this topic. To get a general impression, read a short report by Laila Tajeldine. Available at: https://inosmi.ru/20151218/234850836.html

emerges, it carries out adequate management of global processes, but over time the world economic system becomes more complicated – the number of its elements (population, companies, technology, etc.) and connections increases. In accordance with W.R. Ashby's Law, which is sometimes called the law of requisite variety, the control subsystem (WCAC) must be no less complex than the managed subsystem (world economic system) (Ashby, 2021); otherwise, the system is destroyed. At the first stage of the accumulation cycle, the WCAC is quite progressive and is able to effectively endure the growing complexity, but sooner or later the complexity of the GGPS becomes excessive and the center no longer has time to adjust itself adequately. It is at the second stage of the accumulation cycle that the problems of managing the world economic system start to emerge. If the WCAC does not keep up with the world's changes, therefore, Ashby's Law is violated, then E.A. Sedov's Law comes into play; it is also called the law of hierarchical compensation: the growing complexity of the managed subsystem is compensated by the controlling subsystem by imposing restrictions on it (Balatsky, 2013). This statement corresponds to the concept of complexity by Danilo Zolo (Zolo, 2010), according to which politics is the search for a balance between the *security* of the system and the *freedom* of its participants; permanent global shocks of complexity (demographic pressure, growing inequality between countries, mass migration, widespread proliferation of all types of weapons, terrorism, environmental disasters, etc.) lead to the dominance of repressive (restrictive), but quite effective (!) political regimes (Zolo, 2010). This point is confirmed by observations of the world during the period of global turbulence.

The limitless source of the growth of social complexity is found in a fundamental global regularity noticed by Douglas North: the world develops by shifting risks from the physical world to the social world. Thus, knowledge and new technology lead to a decrease in the uncertainty about the surrounding physical environment, but at the same time become a source of social uncertainty (North, 2010, p. 38). The permanent complication of society leads to the desire of the authorities to simplify it, which justifies the formation of authoritarian political regimes.

The above helps to understand how a management deficit is formed in the world economic system in the second half of the capital accumulation cycle. It is in this phase that the WCAC shifts from a constructive policy of managing the world to a destructive one that hampers the development of all its competitors in order to preserve its own privileged position in the GGPS. The mechanism for maintaining neocolonialism becomes an instrument of such a policy. At this stage, the restrained countries express a growing protest against the established world order. It was this protest that urged Russia to launch the special military operation, and Iran and China to move toward an alliance with it. And it is this protest that leads to the deglobalization of the world system and stagnation of U.S. hegemony.

At this point in the analysis, a natural question arises: what prevents the U.S. authorities from rebuilding their system of world governance. Why don't they move on to more progressive political solutions?

Steven Lukes gave exhaustive answers to these questions in his concept of the indivisibility of power (Lukes, 2010). Since power is supported by an appropriate power structure, it cannot be redistributed; it can only be destroyed and rebuilt anew (Lukes, 2010, p. 105). Power is not like a big pie, from which you can cut off a piece of the right size and share it with a competitor. It is all or nothing. That is why the U.S. global power, supported by the appropriate power structure, cannot be slightly adjusted so as to resolve global conflicts with competitors such as China and Russia. Any concession of power by the United States will

require the complete dismantling of the existing architecture of global power networks; and this move can result in a complete loss of the country's position (Balatsky, 2019). Thus, the demand for the preservation of power and the *phenomenon of the indivisibility of power* automatically lead to the loss of its effectiveness and the relocation of the center of capital to another geographical niche. It is this process that leads to the confrontation of various centers of power with its inherent world wars of various types.

Let us provide a brief summary of the above: the objectivity of the capital accumulation cycle and the change of the WCAC against the background of extremely high stakes in the game – world power and superprofits – make the struggle of competing states absolutely uncompromising, which is why the U.S. has a bulldog determination concerning Russia which is well placed to become a new leader. In other words, the United States cannot help but fight with Russia, just as Russia cannot help but fight with the United States. Taking into account other circumstances, this war develops into a West/Non-West civilizational confrontation.

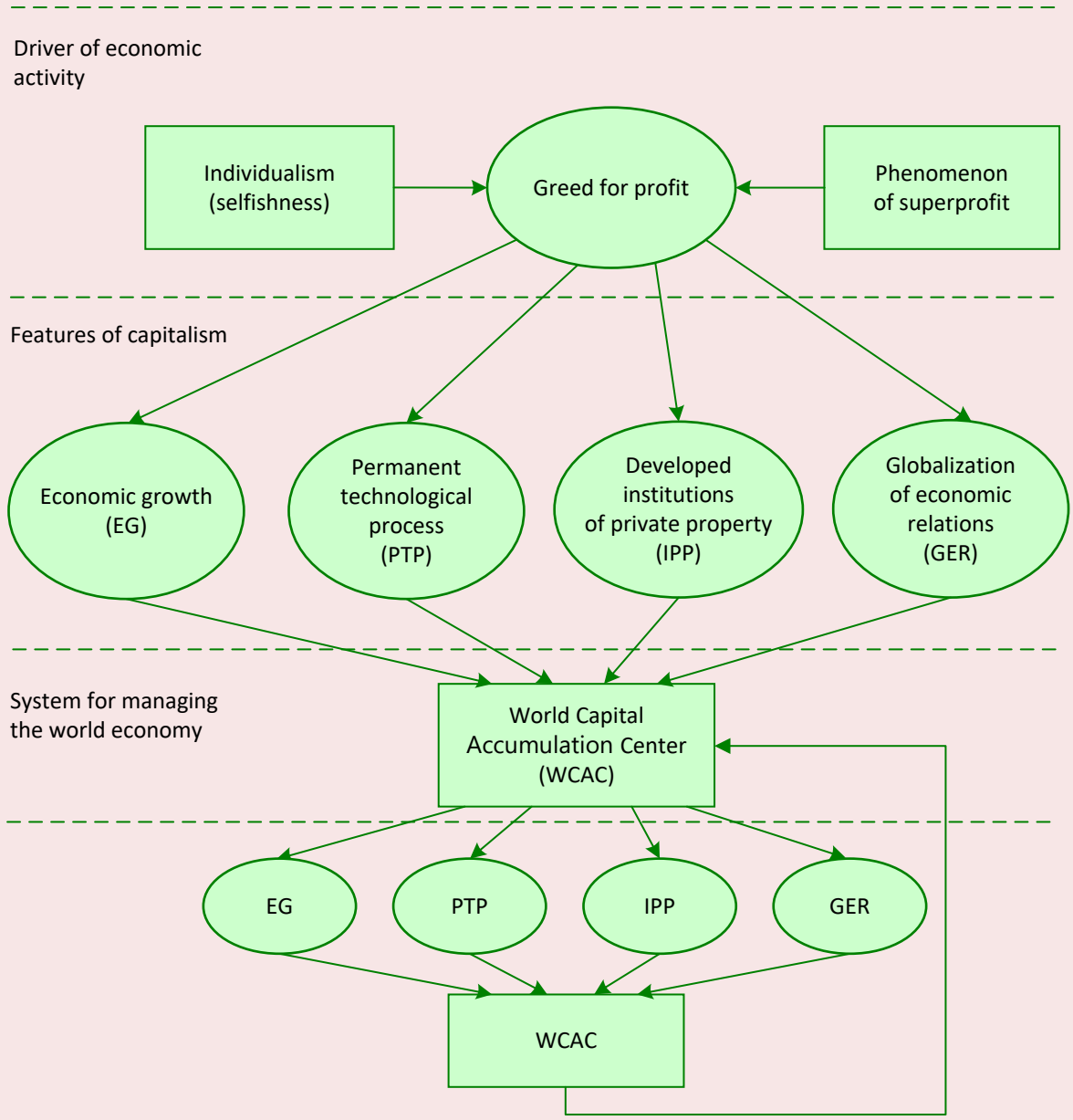
Features of the current period of global geopolitical turbulence

The described logic of changing accumulation cycles has a general character, but currently requires serious clarification due to the scale of the ongoing geopolitical shifts. Let us look at these aspects in more detail.

To begin with, let us recall the historical chronology of Arrighi's cycles of accumulation: the First Cycle, 1560–1740, Venetian-Genoese (lasted 180 years); the Second Cycle, 1740–1870, Dutch (130 years); the Third Cycle, 1870–1970, British (100 years); the Fourth Cycle, 1970–present day, American (≈80–85 years) (Arrighi, 2006, pp. 42–49). This pattern allowed Arrighi to assert that the duration of the accumulation cycle is decreasing over time, and the era of the decline of U.S. power has already begun and now the country is in the stage of terminal crisis. According to Arrighi's chronology, the Fourth Cycle of Accumulation should end around 2055, which is a little more than 20 years away, during which a new WCAC should emerge. However, so far this center has not been determined, and therefore a violation of the established rhythm of cycle change is possible. This is due to the following features of the current global geopolitical turbulence.

The first feature of the Fifth Cycle of Accumulation is that it is formed in the phase of the extinction of capitalist effects, including the extinction of economic growth. For a better understanding of this limitation, we can refer to *Figure 2* that shows the origins of world capitalism and its fundamental features, without which its continued existence can hardly be imagined. One of these signs is the phenomenon of economic growth, but for more than a decade there have been discussions about its coming to an end due to reaching its physical limit. Thus, Richard Heinberg proves that three insurmountable obstacles stand in the way of further economic growth: depletion of key natural resources (oil, metals, water, heavy elements, etc.); deterioration of the environmental situation (pollution of the oceans, air pollution in cities, climate change, etc.); over-accumulation of state and non-state debt (the inability to service accumulated debts without triggering an global economic catastrophe) (Heinberg, 2011). World statistics indicate if not a complete halt in growth then at least a slowdown in its pace in almost all countries. This means that a future fifth WCAC will not be able to emerge in the GGPS on the wave of universal growth; this is why its crystallization stage will be slowed down. Most likely, the disruption of a global growth regime will prolong the Fourth Cycle of Accumulation and postpone the arrival of a new leader state. It is evidenced by the fact that possible contenders for a new WCAC – the United States, China, Russia and, perhaps, Iran – are making no headway in this regard.

Figure 2. Features of capitalism and the cycles of capital accumulation



Source: own elaboration.

The second feature is closely related to the first and consists in slowing down technological progress. Labor productivity growth rates, as well as economic growth rates, have been declining in all countries in recent decades, and there is no guarantee that this trend will be replaced by a new technological explosion. According to Klaus Schwab, the growth rate of labor productivity in the United States over the past 70 years has more than halved (Schwab, 2018, p. 46). At the same time, only 0.5% of the U.S. workforce is employed in industries that did not exist at the beginning of the 20th century; less than

8% of new jobs were created in the 1980s and only 4.5% of new jobs were created in the 1990s (Schwab, 2018, p. 51). Thus, current technological progress leads to a slow increase in labor productivity and is hardly promoting the supply of new labor. This slows down the effect of industrial expansion, which a new WCAC should rely on.

The third feature is the final destruction in 2022 of the "sacred" property right on which the capitalist system was based. The arrest of the gold and foreign exchange reserves of a sovereign state, Russia, by the West, the arrest of foreign accounts and real estate of many citizens and companies of Russia and Belarus (oligarchs, officials, etc.), provision of legal protection to persons illegally occupying private housing in the absence of their owners, forced withdrawal of their citizens' businesses from Russia, non-interference of the police in the outrages of looters during the 2020 pre-election period of the U.S. presidential race, etc. – all this proves the collapse of the institution of private property. In such conditions, the launch of the Fifth Cycle of Capital Accumulation may require a fundamental restructuring of the world capitalist system, even if it is preserved. This feature imposes institutional restrictions on the Fifth WCAC that are not yet fully understood.

The fourth feature of the Fifth Cycle of Accumulation is associated with the effect of globalization. On the one hand, the completeness of this process predetermined the gigantic scale of all geopolitical castling, on the other – the SMO in Ukraine finally consolidated the trend toward deglobalization. This, again, will greatly hinder a new WCAC from spreading its economic influence and increasing its relative power.

All these features do not just interfere with the normal change of the WCAC, but also urge us to think under what kind of economic and political system this change will take place. Given that the most probable contender for the Fifth WCAC, China, is currently a state ruled by the Communist Party, and another potential contender, Russia, has experience (albeit negative) in building a communist regime, we can say that replacing the traditional capitalist system during the geopolitical inversion remains an open question.

In this regard another question arises, which concerns a new model of world governance. Speaking about it back in 1947, A. Toynbee shrewdly remarked: "Salvation perhaps lies, as so often, in finding a middle way. In politics, this golden mean would be something that was neither the unrestricted sovereignty of parochial states nor the unrelieved despotism of a centralized world government; in economics it would be something that was neither unrestricted private enterprise nor unmitigated socialism" (Toynbee, 2011, p. 35). But if the despotism of the U.S. ruling the world in the previous 30 years is weakened by a new WCAC, then can we assume that a concentric model of capital accumulation will be preserved? Or will the hotly-disputed multipolarity prevail in one form or another?

These questions remain open for now.

We cannot but emphasize that the emerging shift of the current WCAC obviously implies a slowdown in the formation of a new accumulation cycle. So, if earlier all the castling moves concerning a WCAC took place inside the West and Western civilization, then a new center will definitely be outside the West – be it Russia or China, it does not matter. This complicates and prolongs the period of geopolitical turbulence. The situation is also aggravated by the ongoing castling of the countries of the Center and Periphery. Thus, the countries of Europe, which traditionally formed the core of the world economy and the center of our Civilization, are slowly but surely turning into its periphery, while the countries of Asia are moving in quite the opposite direction (Volkonskii, 2021).

What has been said above introduces a significant element of uncertainty into the process of ongoing geopolitical inversion.

Russia as a center for assembling a new system of world order

By 2022, Russia has unwittingly found itself in the midst of geopolitical shifts. It has the economic and geopolitical parameters that make it a potential new WCAC. Its possibilities for developing its own territory are almost limitless, which allows it to "launch" the scale effect and thereby achieve high effectiveness of any megaprojects. It also has a huge potential for accepting immigrants, which has always been its typical feature.

The brewing global resource crisis has led to a rearrangement of basic economic values: the primacy of natural resources and the secondary nature of technology have become obvious. And it is natural resources that Russia possesses in abundance, compared to any other country. Arrighi also noticed the alternation of extensive and intensive types of development of the world system during the formation of capital accumulation cycles. Thus, under the Genoese and the British capital accumulation regimes, the expansion of the world economy took place, and under the Dutch and American regimes – its geographical consolidation (Arrighi, 2006, p. 41). Consequently, the next cycle should again become extensive, and only Russia is capable of doing this today – neither China, nor the U.S. or Brazil have such potential.

Moreover, Jared Diamond justified the priority of Eurasia in the birth of modern human civilization by its successful geometric shape compared to other continents: it stretches from east to west, rather than from south to north like America and Africa (Diamond, 2010). In his opinion, this was the reason for the spread of all its product innovations horizontally, that is, much faster and easier than vertically in other regions where it was necessary to overcome natural differences in climate. Paradoxically, today Russia still has this advantage compared to America and even China; but today Russia's advantage is additionally backed by such factors as climate warming, the availability of modern technology, etc.

It is worth noting that the "horizontal effect" provides Russia with vast opportunities to disseminate technological innovations in the context of over-accumulation of world capital and its readiness to take part in the development of profitable economic areas (in Figure 1, this advantage of Russia is emphasized by its elliptical shape, in contrast to circular shapes of other countries). This gives Russia enormous objective advantages in the geopolitical game. However, the country has been dealing with subjective negative circumstances for 31 years: lack of political sovereignty and a capable power elite, gradual extinction of the labor and creative activity of the masses, brain drain, etc. However, the rise of Russia will mean the inevitable decline of the United States, which the American establishment cannot allow. That is why the United States is playing its geopolitical game by waging a Fourth (hybrid) World War against Russia.

Let us return once again to the point that the main contradiction in Russia's development in the previous period, which was growing under Boris Yeltsin, Dmitry Medvedev, and Vladimir Putin, has finally matured by 2022: Russian citizens' life was improving, while the country was falling into an abyss. In other words, the one-sided economic development at the expense of the commodities sector alone, which makes it possible to "spread" the income from natural rent among the population, has become obvious and unbearable. This contradiction played its part in the split of society at the time when the SMO was launched: a significant part of Russians wanted their life to remain the same, while others did not want it. The SMO itself, which not only exposed Russia's economic problems, but also consolidated other countries in a hybrid war against the United States, has become a *key event in history* and the starting point of the global geopolitical confrontation between the West and the Non-West.

Conclusion

In the paper, we have made an elementary reconstruction of the post-war events that reveal the logic of the current geopolitical turbulence. The analysis helps to understand why modern Russia is in an extremely contradictory situation: while possessing an enormous economic potential, even after 31 years since the collapse of the USSR, it still lacks crucial economic sectors. At the same time, it is characterized by a unique geopolitical position, which makes it a most likely contender for the role of a WCAC in the Fifth Cycle of Accumulation. These two facts produce a powerful contradiction both within the Russian Federation and abroad in the eyes of political competitors; this leads to social tension in the global economic system. The severity of the above contradictions led to the fact that it was Russia that acted as the primary detonator of geopolitical shifts.

Related scientific concepts were used to reconstruct the events preceding the 2022 SMO: economic (Trout's mistake, neocolonialism); cybernetic (Ashby's Law and Sedov's Law); managerial (external management, hybrid warfare); synergetic (synergetic effect, system complexity, order, chaos); political science (security and freedom, power structure); political economy (capital accumulation cycle, global capital center, rate of return); institutional (shifting risks from the physical world to the social world); geographical (horizontal diffusion of innovations); psychological (war of meanings, war of nerves). This made it possible to bring together many poorly compatible phenomena and reveal the logic of the geopolitical competition that has taken place over the past 50–60 years.

We find the result of the analysis in the conclusion according to which Russia, being in the epicenter of geopolitical turbulence, cannot avoid a direct collision with the Collective West. From now on, over the next 15–20 years, the country will have to go through all the hardships of the Fourth (hybrid) World War. The question regarding the possible outcome of this war is beyond the scope of the present paper.

References

Arnaud D. (2009). *Navukhodonosor II, tsar' Vavilonskii* [Nabuchodonosor II, roi de Babylone]. Moscow: Molodaya gvardiya.

Arrighi G. (2006). *Dolgii dvadtsatyi vek: Den'gi, vlast' i istoki nashego vremeni* [The Long Twentieth Century: Money, Power, and the Origins of Our Times]. Moscow: Territoriya budushchego.

Arrighi G. (2009a). Afterword to the second edition of "The Long Twentieth Century". *Prognozis,* 1(17), 34–50 (in Russian).

Arrighi G. (2009b). *Adam Smit v Pekine: Chto poluchil v nasledstvo XXI vek* [Adam Smith in Beijing: Lineages of the Twenty First Century]. Moscow: Institut obshchestvennogo proektirovaniya.

Ashby W.R. (2021). *Vvedenie v kibernetiku* [An Introduction to Cybernetics]. Moscow: Lenand.

Balatsky E.V. (2011). Z. Bauman's concept of liquid modernity and its applications. *Obshchestvennye nauki i sovremennost'=Social Sciences and Contemporary World,* 3, 134–146 (in Russian).

Balatsky E.V. (2013). Concept of complexity and economic theory of democracy. *Obshchestvo i ekonomika,* 5, 5–24 (in Russian).

Balatsky E.V. (2014). Prerequisites for global geopolitical inversion. *Economic and Social Changes: Facts, Trends, Forecast*, 2(32), 28–42.

Balatsky E.V. (2019). Measurement of Power by Steven Lukes. *Mir Rossii=The Universe of Russia*, 28(2), 172–187 (in Russian).

Balatsky E.V. (2021). Return on equity as an economic growth driver. *Economic and Social Changes: Facts, Trends, Forecast*, 14(1), 26–40.

Balatsky E.V., Ekimova N.A. (2020). Driving the economy: The role of a special economic sector. *Journal of New Economy*. T. 21. № 3. S. 5–27.

Devyatov A.P. (2020a). *Nebopolitika. Dlya tekh, kto prinimaet resheniya* [High Politics. For Those Who Make Decisions]. Moscow: IP Sokolova A.A.

Devyatov A.P. (2020b). *Razvedka budushchego kak iskusstvo obrazov i podobii* [Exploration of the Future as the Art of Images and Likenesses]. Moscow: IP Sokolova A.A.

Diamond J. (2010). *Ruzh'ya, mikroby i stal'. Istoriya chelovecheskikh soobshchestv* [Guns, Germs, and Steel: the Fates of Human Societies]. Moscow: AST.

Gusev A.B., Yurevich M.A., Ekimova N.A., Advokatova A.S. (2022). Post-Soviet space thirty years on: Independence vs synergy. *Terra Economicus,* 20(2), 21–39 (in Russian).

Heinberg R. (2011). *The End of Growth: Adapting to Our New Economic Reality*. Cabriola Island, B.C.: New Society Publishers.

Huntington S. (2021). *Stolknovenie tsivilizatsii* [The Clash of Civilizations]. Moscow: AST.

Ilyin V.A., Morev M.V. (2022). The Rubicon has been crossed: February 24, 2022, Russia entered a new stage in its development in the 21st century. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 15(2), 9–30. DOI: 10.15838/esc.2022.2.80.1 (in Russian).

Komleva N.A. (2017). Hybrid war: Essence and specific features. *Izvestiya Ural'skogo federal'nogo universiteta. Seriya 3: Obshchestvennye nauki=Bulletin of Ural federal university. Ser. 3, Humanities,* 3(167), 128–137 (in Russian).

Lukes S. (2010). *Vlast': Radikal'nyi vzglyad* [Power: A Radical View]. Moscow: Izd. dom GU-VShE.

North D. (2010). *Ponimanie protsessa ekonomicheskikh izmenenii* [Understanding the Process of Economic Change]. Moscow: Izd. dom GU-VShE.

Schwab K. (2018). *Chetvertaya promyshlennaya revolyutsiya* [The Fourth Industrial Revolution]. Moscow: E.

Shebarshin L.V. (2017). *Ruka Moskvy. Zapiski nachal'nika vneshnei razvedki* [The Hand of Moscow. Notes of the Chief of Foreign Intelligence]. Moscow: Algoritm.

Toynbee A.J. (2011). *Tsivilizatsiya pered sudom istorii. Mir i Zapad.* [Civilization on Trial]. Moscow: AST: Astrel'.

Trout J. (2009). *Bol'shie brendy – bol'shie problemy* [Big brands, Big Trouble: Lessons Learned the Hard Way]. Saint Petersburg: Piter.

Volkonskii V.A. (2021). *Smyslovye ustanovki i rol' gosudarstva v epokhu mnogopolyarnogo mira* [Semantic Attitudes and the Role of the State in the Era of a Multipolar World]. Moscow: Knizhnyi mir.

Zolo D. (2010). *Demokratiya i slozhnost': realisticheskii podkhod* [Democracy and Complexity: A Realist Approach]. Moscow: Izd. dom GU-VShE.

Information about the Author

Evgeny V. Balatsky – Doctor of Sciences (Economics), Professor, director, Center for Macroeconomic Research, Financial University under the Government of the Russian Federation (4, 4th Veshnyakovsky Lane, Moscow, 109456, Russian Federation; e-mail: evbalatsky@inbox.ru); Chief Researcher, Laboratory of Mathematical Economics, Central Economics and Mathematics Institute, Russian Academy of Sciences (47, Nakhimovsky Avenue, Moscow, 117418, Russian Federation)

Received August 1, 2022.

DOI: 10.15838/esc.2022.4.82.4
UDC 332.055.2, LBC 65.04

The Impact of Institutional Factors on Economic Dynamics in the Regions

Andrei A.
BLOKHIN
Institute of Economic Forecasting, Russian Academy of Sciences
Financial University under the Government of the Russian Federation
Moscow, Russian Federation
e-mail: andraleks@rambler.ru
ORCID: 0000-0003-2132-4664; ResearcherID: R-6009-2017

Aleksei A.
LIKHACHEV
Institute of Economic Forecasting, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: 79168346515@yandex.ru
ORCID: 0000-0003-0109-4873

Abstract. The article is devoted to the problem of combining institutional and economic features in regional research and forecasting. We substantiate that the importance of institutional factors, including those in the regional context, manifests itself under significant differences in the institutional conditions for business that make it possible to receive stable institutional rent; this leads to the stratification of business by levels of alpha, beta and gamma business. The object of the study is top large business in the region. The distribution of major global and federal companies in the context of regions, as well as the presence of an established group of leaders in the regional economy, requires their separate monitoring and forecasting. We propose our own approach to determining the features of consolidation of large business. We show that the range of dispersion of their levels among regions and over time is significant and can be tens of percent and/or percentage points, which urges researchers to focus on these indicators.

For citation: Blokhin A.A., Likhachev A.A. (2022). The impact of institutional factors on economic dynamics in the regions. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 60–73. DOI: 10.15838/esc.2022.4.82.4

By comparing the features of consolidation of large business in the regions and using the constructed quantitative estimates, we substantiate the typology of methods (models) of economic growth in regions, depending on the presence or absence of major global, federal, and regional companies in them and their role in regional economy. Theoretical significance of this approach consists in combining the institutional analysis of the architecture of regional markets with the cost and physical aspects of the analysis; this will help improve the quality of diagnostics of regional and interregional problems and the validity of forecasts. Practical significance is determined by the possibilities of taking into account the architecture of regional markets in regional economic policy.

Key words: institutions, institutional conditions, institutional rent, alpha business, consolidation of large business, economic growth of regions, institutional geography.

Introduction

In the analysis and forecasting of spatial development of economy, the focus is usually on macroeconomic, social, and technological indicators. One also considers development trends in infrastructure and mineral resource base, as a rule, in physical indicators. The cultural, historical, climatic, environmental, and geographical characteristics are taken into account. Depending on the objectives of the study, regions are divided into more or less homogeneous groups on the named features, and then are compared with each other (Granberg, 2000; Leksin, Shvetsov, 2012; Mikheeva, 2021).

Institutional factors contributing to regional development are not included in macroforecasts and "gravitate" rather to political science formulations about federalism, electoral preferences or geopolitics or are analyzed in the context of budget, tax, customs, monetary policy (Ilyin, Povarova, 2017; Kuvalin, 2019), issues of reforming various spheres of activity. In this framework, there are disputes between proponents of supporting regions as engines of growth or the need to equalize levels of the territories' development, agglomerations' development, and stimulating shifts in the structure of productive forces and the settlement system (Marchenko, Machul'skaya, 2000; Savel'eva, 2012; Zubarevich, 2014). In the same paradigm, the Strategy for the spatial development of the Russian Federation for the period through to 2025 was developed and approved[1].

From the economic point of view, the institutional space of the country is usually perceived as generally homogeneous (taking into account the separation of powers between the federal, regional and municipal levels), and its change – depending on the political will of the legislative and executive powers. Within the framework of the existing institutions, the current management system and its strategic lines of development are characterized by a large weight of "core–periphery" links and relatively weak transregional interaction (Barbashova, Gerasimova, 2018; Klimanov et al., 2021).

However, presenting the institutional space of the country as homogeneous is a strong simplification, because of which institutions are usually considered separately from other factors contributing to economic development. Institutional space, on the other hand, is usually presented as a metaphor not connected to the territory. At the same time, in economic science there is an established opposition of geographical and institutional aspects in determining the most significant factors influencing economic growth.

[1] Strategy for the spatial development of the Russian Federation through 2025: RF Government Order 207-r, dated February 13, 2019.

D. Frolov points to the incorrectness of this opposition caused by historical scientific specialization: "Economic geographers for many years massively neglected to take into account the role of institutions in spatial development. For their part, institutional economists, while emphasizing changes in institutions over time, ... have largely abstracted from the territorial specificity of individual institutions and the institutional environment as a whole" (Frolov, 2015).

A number of foreign works consider institutional differences from a country perspective (Busenitz et al., 2000; Freeman, 2002; Wind et al., 2017). Institutional differences between regions within one country tend to be significantly less pronounced (Lugovoy et al., 2007). Institutional differences between regions are mostly studied in the aspect of heterogeneity of the cultural environment to form regional approaches to governance (Schlevogt, 2001; Peterson, van Iterson, 2015).

We should note that there is no certainty about what constitutes the content of spatial economics and what is its place in economics. The existing approaches within the regional economy do not meet the need to describe the spatial aspect of multidimensional economic systems in modern conditions (Minakir, Dem'yanenko, 2010). Even more these problems relate to institutional economic geography, which is still in its infancy (Sheppard, 2008). Therefore, the development of the methodological basis and the formation of new approaches to institutional research in the spatial context seem to be urgent tasks.

P. Minakir believes that the dichotomy of institutional space is similar to the "wave–particle" duality in quantum mechanics and should be considered in the case of an explicit transition in management practice to the position of spatial dichotomy: "space – set of places – space – system of relations" (Minakir, 2016). But for using such properties, in particular to design strategies for regional development, it is necessary to develop approaches to its study, including the allocation of institutional factors contributing to spatial development and their analysis. Here we can refer to the experience of geographical science, where it is customary to speak of such properties of geographical space as continuity and discreteness, equally inherent in the objects of geography (Armand, 1969). By the first is meant the absence of discontinuities of space, and the second is expressed in the presence of discontinuities, the localization of habitats. And P. Baklanov talks about their varying degrees in all types of geosystems (Baklanov, 2015), with the universality of such properties of geographical space applies to both natural and socio-economic territorial complexes. Thus, we can divide the institutional space in the framework of the named dichotomy into regions (areas) with approximately homogeneous institutional environment, that is, with a characteristic value of the institutional indicator. It is possible to consider the territory under study as a continuous field of values of such indicators. The use of one or other approaches, as well as their combination for mapping the institutional space can become a methodological basis for the development of institutional geography.

The article substantiates that institutional analysis can and should play a major role in the study and forecasting of the spatial development of the Russian economy. Expanding the scope of its application and combining it with the cost, social and material aspects of analysis, as well as the formation of methodological approaches to the study of institutional factors in the spatial aspect will improve the quality of assessment of regional and interregional problems, the validity of forecasts and the overall effectiveness of regional policy.

Institutional heterogeneity of the economy in the regional context

When studying the institutional space, the focus should be on the existing differences in the institutional conditions for business in the regions,

rather than comparing the existing institutions to some "reference" ones. This approach is consistent with the ideas of economic dominance theory in a multilevel economy (Blokhin, 2019; Blokhin et al., 2019; Vertogradov, 2020). According to this theory, businesses operating in the best institutional conditions receive institutional rents and, because of this, dominate the rest. The differences in conditions are manifested primarily in the availability of cheap funding, government support, more modern technology, any other quality resources. Yaremenko (Yaremenko, 1981) wrote about the replacement of quality resources by mass resources in the Soviet economy, but similar patterns apply to all major economies and even to the global economy (Blokhin, 2019).

Receiving institutional rent as an additional income and source of its development, business grows ahead of others, invests more, including in changing the rules and institutions that consolidate its leadership position. According to this theory, the economy is "stratified" into levels of alpha-, beta-, and gamma-businesses depending on the institutional conditions of their existence. Barriers are formed between the levels, which can become insurmountable – "locking" businesses in their level as in "institutional traps" (Polterovich, 1998).

In the regional context, the significance of institutional factors is determined by how they change differences between regions – strengthening or weakening them, creating conditions for institutional rents and the dominance of some business groups over others and, possibly, of some regions over others. In "neglected" cases, such interregional traps can become the reasons for the formation of depressive territories or other zones of ineffective development.

In its entirety, the task of describing interregional channels for obtaining institutional rent is too complicated, since the natural regional ways of domination: the federal center over the federal constituent entities, the capital over the periphery, large cities over the suburbs, etc., are superimposed on a complex system of domination in the respective territories by large and large businesses over medium and small businesses. At the same time, the "grid" of such relations depends on the geographical distribution of business not directly, but through the consolidation of large Russian and foreign businesses from various industries in specific regional markets. The relocation of this business activity to new regions, whether it is the relocation of headquarters or the creation of large production units, the formation of growth poles (Perroux, 1968) or the development of related technological chains (Lukin, 2022), sometimes fundamentally changes the regional and interregional system of dominance associated with the architecture of the respective markets (Bourdieu, 2005; Radaev, 2011; Fligstein, 2013).

Thus, one should consider the heterogeneity of institutional space in a combination of three aspects:

- the difference between internal institutions, the conditions they create for business and external, foreign ones;
- delineation of political and administrative conditions in the country related to tax, budgetary, and other financial and economic powers;
- the difference in the architecture of regional markets on the consolidation of large businesses, in the formation by market leaders of their preferred zones, and in the barriers to entry into these market zones for other market participants.

It is likely that they are all interconnected, and the behavior of the largest businesses plays a leading role in this "triad", as they have the power and ability to influence federal and regional political institutions. From the point of view of Ya. Pappe and Ya. Galukhina, it is the possibility of such influence that is the fundamental distinction of superlarge business (Pappe, Galukhina, 2009). However, without going into the intricacies of the interaction between the state and business, in this article we will limit ourselves to an analysis of the

third aspect of these, while understanding its more significant role in the formation of the institutional space of the regions.

We should note that in recent years there have been created a lot of ratings that characterize the institutional indicators of regional development, including Credit ratings of regions, National rating of investment climate in the regions of the Russian Federation, Rating of management efficiency in the regions of the Russian Federation, Rating of regions on the level of promotion of competition, Rating of investment attractiveness of Russian regions (RAEX). All these and many similar ones confuse the three aspects of institutional heterogeneity mentioned above, or single out particular narrow aspects related, for example, to innovation or public-private partnerships. A convenient and, consequently, a source of aggregated information for assessing the differences between regions in terms of market architecture has not yet been created. Perhaps it can be built on the basis of the approach proposed in the article to compare regions by institutional features.

Constructing such a rating can create a system of assessments of the institutional profile of the region both for use in monitoring and comparing regulatory influences with regional specifics, and for the development by business of its regional strategies. Suggestions for creating such a ranking are not a direct task set forth in the article, but may subsequently become its additional result. It seems that the key characteristics of describing the markets architecture are the stability of their leading business groups and the consolidation of the market around this leading group. In any case, even their analysis, as the article shows, yields profound substantive and quantitative results.

A number of institutional indicators associated with the concentration of business in the economy sectors and its consolidation around the market-leading group of companies may reflect qualitative changes in the architecture of markets, the strengthening of explicit or implicit dominance, the formation of institutional barriers and traps. Other institutional factors associated with regional or sectoral tax policies, export support, development of federal infrastructures or branch networks of banks, intermediary organizations, and other institutional factors may also manifest themselves in such an analysis.

Many of the factors mentioned are sustainable and should therefore be used in forecasting both institutional transformations and economic dynamics. And vice versa, factors different in their degree of sustainability should be included in the corresponding forecasts in different ways, taking into account their horizon and the accuracy of their estimates. At the same time, to include institutional factors that do not have high stability, but significantly determine the development of certain business groups, it is necessary to build alternative scenarios for the development of the economy as a whole or its individual sectors. We should add that transformations in the architecture of markets associated with the outstripping growth of large business have a significant impact on industry dynamics and structural shifts, but they are not synchronized across industries and are uneven over time, which complicates the task of analyzing and forecasting them.

Taking into account the above mentioned, the article aims to substantiate the significance of institutional heterogeneity of the spatial structure of the economy and to propose an approach to its description and consideration in forecasting.

Consolidation characteristics of large business in the regions

We used the following methodological approach for our calculations. For each region, we took data from SPARK-Interfax on the 1,000 largest Russian companies in terms of revenues for 2010–2019. As the leader in each region, we identified a group of the 10 largest companies in terms of revenues for the corresponding year. We took data until 2019 to

exclude the effects of "pandemic" years. The rest of the region's companies were not taken into account. The method is convenient for express analysis of structural dynamics, because the revenue of the first 1,000 companies in the regions according to SPARK correlates closely with the revenue of the entire regional business according to Rosstat (correlation coefficient – 0.98). Hereinafter, when talking about the consolidation of large businesses in the regions, we will use these data, unless otherwise specifically stated. We calculated consolidation as the ratio of the revenues of the 10 largest companies in a region to the revenues of the first 1,000 companies.

Consolidation indicators of large businesses in the regional market can be assessed by the share of the top 5, top 10 companies in the overall performance, such as revenue or other selected number of market leaders. For more specific calculations, you can take their variable number for each regional market, taking into account the stability of the leading group formed in it. However, for simplicity, we will limit ourselves to singling out the top 10 companies in each region.

The differentiation of institutional conditions by region manifests itself differently in economic development indicators. Large business influences the volume and proportion of products simply because it produces more than others, becomes a development leader or "pumps out" resources from the region, creates high multipliers for other industries, not only in inter-regional product flows, but also through the wages and demand of its workers, the diffusion of technology, the formation of standards and regulations, the development of market and material infrastructure for regional markets, as well as through other direct and indirect influences. Besides, large business sets the balance of interregional economic relations. In this article we will consider only some of such factors, but we believe it is necessary to outline their wide range for research.

The data obtained on the consolidation of large business confirm *(Tables 1–3)* the high differentiation of regions by selected parameters.

As we can see from Table 1, the core of regions with high consolidation is fairly stable, although its composition has changed. In particular, by 2019, the Astrakhan, Tomsk, Magadan and Murmansk oblasts ousted the Karachay-Cherkess Republic, the republics of Sakha (Yakutia), Tyva and Ingushetia from the group of "leaders of 2010". The other six regions remained on the list, although they changed their position. Such changes occurred primarily under the influence of sectoral shifts in the economy, as well as the development of all-Russian infrastructures. We should note that a high/low level of consolidation by itself does not indicate a higher or lower development of the region's economy.

Table 1. Regions with the highest consolidation of large business in 2010 and 2019, %

Region	2010	Region	2019
Chukotka AO	84.1	Komi Republic	76.2
Republic of Ingushetia	67.1	Chukotka AO	75.9
Komi Republic	64.8	Astrakhan Oblast	70.0
Tyva Republic	63.7	Vologda Oblast	66.21
Republic of Sakha (Yakutia)	62.2	Republic of Khakassia	58.3
Republic of Buryatia	60.1	Magadan Oblast	55.5
Karachay-Cherkess Republic	59.5	Republic of Buryatia	55.2
Vologda Oblast	57.2	Orenburg Oblast	53.6
Republic of Khakassia	55.4	Tomsk Oblast	52.7
Orenburg Oblast	55.2	Murmansk Oblast	52.4
Source: SPARK-Interfax, own calculation.			

Table 2. Regions with the lowest consolidation of large business in 2010 and 2019, %

Region	2010	Region	2019
Ivanovo Oblast	18.9	Voronezh Oblast	16.7
Voronezh Oblast	19.1	Sevastopol	17.7
Rostov Oblast	20.0	Ivanovo Oblast	19.7
Penza Oblast	21.8	Moscow Oblast	19.9
Kirov Oblast	22.1	Kirov Oblast	21.7
Primorsky Krai	22.4	Omsk Oblast	23.5
Novosibirsk Oblast	23.1	Rostov Oblast	23.7
Moscow Oblast	24.7	Chuvash Republic	23.8
Altai Republic	25.3	Crimea	24.1
Tver Oblast	25.5	Smolensk Oblast	24.3
Source: SPARK-Interfax, own calculation.			

Table 1 includes both economically more developed regions and "lagging" regions. Similarly, Table 2 shows the regions with the lowest rates of business consolidation in the country.

The core of regions with low consolidation of large business is also quite stable, although its composition has changed by 2019: only five regions have remained, while Crimea and Sevastopol have been added, which means that not only industry, but also geopolitical processes have appeared.

Table 3 presents data on the regions with the strongest dynamics of business consolidation indicators.

As the data in Table 3 indicate, very different regions – from different federal districts, with different levels of economic potential and economic growth, and different social structures of the population – were among the leaders in the growth/decline of consolidation. In general, high or low rates of business consolidation can demonstrate both the presence/absence of strong large business in a region and the diversification of the economy, such as in Moscow.

Full tables with all regions of the country are not included here for space reasons. The leaders of growth, decline, and business consolidation levels are presented to show a wide range of variation in the relevant parameters. It amounts to tens of percentages or percentage points, both over time – over a decade – and in interregional comparison. This alone underscores the need for their careful study, especially the qualitative analysis of the institutional factors underlying such changes and their possible impact on the regional structural shifts and institutional transformations in the future.

Table 3. Leaders of growth and decline in the relative level of consolidation of large businesses

Regions-leaders of consolidation growth	2019 to 2010, %	Regions-leaders of consolidation decline	2019 to 2010, %
Primorsky Krai	45.7	Karachay-Cherkess Republic	-76.9
Altai Republic	38.3	Republic of Ingushetia	-52.0
Novosibirsk Oblast	37.6	City of Moscow	-51.5
Krasnodar Krai	37.5	Chechen Republic	-48.1
Tomsk Oblast	29.9	Omsk Oblast	-45.1
Pskov Oblast	29.8	Tula Oblast	-31.5
Murmansk Oblast	27.3	Chuvash Republic	-28.2
Astrakhan Oblast	24.8	Tyva Republic	-27.5
Republic of North Ossetia–Alania	24.5	Moscow Oblast	-23.9
Magadan Oblast	20.8	Republic of Sakha (Yakutia)	-20.8
Source: SPARK-Interfax, own calculation.			

We emphasize that the decomposition of macroeconomic regional and industry indicators by business size, such as revenue, value added, capitalization and others, has not yet been applied in economic analysis and forecasting. The proposed approach makes it possible to build an array of relatively accurate data on the level and trends of business consolidation by industry and region of the country in relatively economical ways. The analysis of such an array expands the possibilities of studying economic processes and helps to assess the influence of institutional factors on the economic dynamics in regions, industries, and individual markets.

Institutional features of economic growth in the regions

The characteristics of leadership group sustainability and big business consolidation by industry or region may reflect different ways (or models) of economic development.

• Market dominance of foreign companies, including global ones.

• Market dominance of Russian companies at the federal or global level (possibly from other regions), supported by the state or belonging to the public sector.

• 10–20 large companies competing for the position of market leaders in the absence of obvious dominance (in this case, the formation of the leading group in the market can only be predicted, but its dynamics may already differ from the rest of the population).

• Lack of obvious market leaders and potentially forming their group (in this case, the market can develop due to the growth of segments of medium or small businesses or related industries/regions, the sustainability of such dynamics is determined by the potential development of its growing segments).

Combinations of these methods (models) of regional economic development are also possible.

For all constituent entities of Russia, we investigated the dynamics of business growth in terms of revenue over 10 years (from 2010 to 2019) for two clusters: from 1 to 10 (the first 10 companies in the region – the leaders of regional business) and from 11 to 1,000 (the next 990 companies). Here we make a reservation that these clusters are characterized by more or less stability of their composition. Some companies during this period for one reason or another leave the cluster – they close, reorganize, are absorbed by others or merge with them, while others companies appear. In a certain sense, the first ten and the following 990 companies are abstract, because they are not so much about specific companies, but rather about their commonalities (the leading group and the rest). In this logic, a company is not only a specific organization, but also a "place in the market", filled by its corresponding organizations or their subdivisions. This approach gives us a characteristic of the two zones of the market, rather than specific companies in it.

For both clusters, the compound annual growth rate is calculated using the formula CAGR (Compound Annual Growth Rate), that is, the geometric mean growth rate by year.

As a rule, the growth of companies slows over time, large businesses are less likely to grow by tens of percent per year over a long period, due to both the higher base and the characteristics of fast-growth companies, which are commonly associated with innovative businesses, medium-sized businesses, often represented by technology companies – "gazelles". The faster growth of the largest businesses may be an indicator of significant structural changes taking place in the region, and the faster rates of the "others" cluster may be due to both organic business growth of these 990 companies and a decline in the growth rates of the leaders due to market conditions or institutional changes. It is supposed that these growth scenarios may have common features for different regions that are not similar in sectoral specialization.

If we distribute all the regions from those where the leading group's growth was the highest ahead of the other companies to those where, on the contrary, it turned out to be the highest ahead of the other companies, the most pronounced effect of institutional factors will be seen at the "edges" of the scale. Accordingly, the less pronounced the differences in these indicators, the lower the need to take them into account when making economic forecasts. *Table 4* shows the regions characterized by the greatest outperformance of large businesses relative to other companies.

Taking into account the data in Table 4, as well as the results of the analysis of Russian regions with outperforming growth of the top 10 companies over the rest, not presented in the table, the following scenarios of economic dynamics can be defined.

• Outpacing growth of federal business headquartered in the region (Krasnodar Krai, Novosibirsk Oblast). In this case a large regional business belongs to global or all-Russian alpha-companies, its development is determined by factors external to the region and should be forecasted separately.

• Outpacing growth of subsidiary business of federal companies in the region (Astrakhan Oblast, Komi Republic, Murmansk Oblast). Large regional business is dependent on the external structure, its costs, profits and revenues are formed outside the region. Its dynamics and the development of the rest of the economy should be forecast separately, and then combine them into a general forecast.

Table 4. Regions with the highest growth rates of the top 10 companies compared to the rest

Region	Difference in CAGR between the 10 largest and other companies, %	Notes
Primorsky Krai	11.2	Entry of federal-level business in the region due to the reorganization of the DNS group (50 legal entities were merged into DNS Retail with an office in Vladivostok)
Krasnodar Krai	9.7	Outperforming growth of federal-level business with head office in the region (JSC Tander – 21.5% per year with regional GRP growth of 10.6%)
Astrakhan Oblast	9.5	Outperforming growth of a federal-level business subsidiary (OOO Lukoil-Nizhnevolzhskneft – from 15th place to 1st in the rating of the largest companies in the region for 10 years)
Altai Republic	8.1	The scale of business and the economy of the region as a whole is small, so in the absence of stable, pronounced leaders, the emergence of a growing business ensures its outpacing growth compared to other
Tomsk Oblast	7.9	Outperforming growth of federal-level business with head office in the region (OOO KDV Group – one of the largest Russian food holdings) and growth of federal-level subsidiary (JSC Tomskneft VNK – PJSC Gazprom Neft – 50%, NNK-Oil – 50%)
Murmansk Oblast	7.2	Outperforming growth of the subsidiary (JSC MMC Kola) of the federal level business (PJSC MMC Norilsk Nickel)
Novosibirsk Oblast	6.9	Outperforming growth of federal-level business with head office in the region: JSC NPK Katren (one of the largest pharma-distributors in Russia), JSC Siberia Airlines (the second largest airline in Russia)
Komi Republic	6.7	Outperforming growth of federal-level business with head office in Moscow (subsidiaries of PJSC Lukoil and PJSC Gazprom)
Republic of North Ossetia–Alania	6.5	Leaders of regional business – newly created companies
Magadan Oblast	6.1	Outperforming growth of federal-level business subsidiaries: JSC Polyus Magadan (PJSC Polyus), JSC Magadan Silver (PJSC Polymetal)
Source: SPARK-Interfax, own calculation.		

• The outstripping growth of large regional businesses. In this case, it can "pull down" the resources of the region and, possibly, of other, nearby territories. Its development is determined by the use of the region's higher-quality resource base, while the rest grows using lower-quality resources.

• Emergence of a leader in the region due to reorganization (Primorsky Krai). In this case the new large business grows differently, not as before, but it is possible to predict this growth only when the new trajectory becomes stable, until then it is reasonable to apply scenario forecasts.

Table 5 shows the regions that are characterized by opposite trends.

Taking the above into account, one can set the following scenarios for the development of regions with the outstripping growth of companies of the second or third echelon.

• Federal/global businesses headquartered in the region show a low growth rate (Moscow). Its development within the region is determined by factors external to the region.

• The subsidiary business of a federal company in a region shows a low growth rate; its costs, profits, and revenues are formed outside the region and depend on the parent company.

• Bankruptcy or reorganization of a large regional business (Omsk Oblast). There is a change

Table 5. Regions with the greatest lag in the growth rate of the top 10 companies compared to the rest

Region	Difference in CAGR between the 10 largest and other companies, %	Notes
Chuvash Republic	-4.0	The absence of a stable group of leaders in a highly diversified regional economy
Republic of Sakha (Yakutia)	-5.3	Increasing diversification of the region's economy due to the investment activity of businesses at the federal level (the beginning of commercial operation of PJSC "Rosneft" Srednebotuobinsk oil and gas condensate field)
Tula Oblast	-5.6	The development of regional business due to the investment activity of the largest companies of the federal business level
Omsk Oblast	-6.1	Bankruptcy of the largest regional business by revenue (SPA "Mostovik", the largest business in the region by revenue in 2010); consolidation of leadership by a federal-level business subsidiary (JSC "Gazpromneft – Omsk Refinery", a subsidiary of PJSC "Gazprom Neft")
Chukotka Autonomous Okrug	-6.4	The emergence of a federal-level business subsidiary among the leaders (the start of gold development in 2013 by OOO "Mayskoye" – gold mining company, PJSC "Polymetal", has brought the company to the 2nd place in the region in terms of revenues)
Tyva Republic	-7.7	Low sustainability of leaders – the largest regional business is losing leadership, showing low growth rate, and its place is taken by foreign business
Moscow	-8.8	The growth of the largest federal businesses lags behind the dynamic growth of large and medium-sized businesses, including subsidiaries
Karachay-Cherkess Republic	-12.2	The lack of an established and growing group of regional business leaders in the region of "crisis post-industrialization"; which "layer" of companies supports economic growth in the region should be specified
Republic of Ingushetia	-12.7	The lack of an established and growing group of regional business leaders in the region of "crisis post-industrialization"; which "layer" of companies supports economic growth in the region should be specified
Chechen Republic	-13.8	Lack of an established and growing group of regional business leaders in the region of "crisis post-industrialization"; a subsidiary of a federal-level business shows a low growth rate (OAO "Grozneftegaz" – PJSC "Rosneft")
Source: SPARK-Interfax, own calculation.		

in the composition of leaders in the region, and not only because this company leaves, but also because other leaders redistribute the market. As a result, the situation becomes unstable and can only be predicted as new trends emerge, prior to which it is reasonable to make scenario forecasts.

• Growth diversification of the regional economy (Chuvash Republic). In this case, the forecast for the region should probably be built separately by segments with different growth rates, and then combine them into an overall forecast.

• The low business resilience of "crisis post-industrialization" regions (Klyuev, 2010) determines the economic dynamics. In such regions, it is better to make scenario forecasts and switch to traditional extrapolation forecasts only as new sustainability factors related to the formation of their architecture emerge.

In addition to those listed above, other scenarios with their own ways of forecasting can be realized, for example:

• large projects are implemented in the region, investments come from other regions, from large regional, federal or international business or other similar sources; in this case, the trends of regional development "break" and the new dynamics will be determined by the development of a new major player against the background of previous processes; before they become stable, it is only reasonable to make scenario predictions;

• small and medium-sized businesses are degrading or "leaving" the region; the shadow, informal economy is growing; more and more value created by companies in the region is being transferred to other regions through technological chains; in these cases, as in the previous one, we should rely on scenario forecasts or assess the dynamics of the official and informal economy separately, and then combine them into a general forecast.

In all of these variants, economic growth in the region is heterogeneous – there are specifics of forecasting and planning, its own typology of stable and growing segments, its own growth models and "production functions" for the more dynamic segments and the rest of the population. If there are no clear differences in the sustainability of segments within a region or industry, their dynamics can be predicted as for a homogeneous population. Each of the above examples and many similar ones are largely determined by institutional factors. At the same time, groups of regions with approximately the same set of such factors can be combined into a general forecast structured by institutional features.

Conclusion and findings

1. When analyzing and forecasting economic processes in the regional context, it is necessary, along with macroeconomic and physical characteristics, to take into account institutional factors, more precisely – interregional institutional heterogeneity of the spatial structure. They are associated primarily with changes in the architecture of regional markets, created by the largest businesses in the region.

2. The theory of economic dominance in a multilevel economy (Blokhin, 2019; Blokhin et al., 2019), which determines the patterns of "stratification" of companies by levels of alpha-, beta- and gamma-business and the receipt of institutional rents by the "higher" levels of this hierarchy, allows to analyze the specified institutional factors.

3. Assessments of the sustainability of the leading group of businesses in the regions and the consolidation of the largest businesses vary significantly by region and are changing dynamically. Structural and temporal differences between them can reach tens of percent or percentage points, and they are not related to the level of economic development of the regions.

4. Regularities in the formation of methods (models) of economic growth in the regions are associated with the dominance of large global, federal, regional business in them or in the

constituent entities interacting with them. They can be identified using large business consolidation data.

5. A comparison of the outperforming/delaying growth of the leading group in the region and the rest of the companies makes it possible to forecast economic growth taking into account the sustainability, structure and dynamics of the largest business in the region. At the same time, forecasts for the leading group and other companies, with significant differences in their parameters, should be built separately, and then combined into a general forecast. Thus, in 19 regions the difference in the growth rates of the leading and the lagging group amounted to more than 5 percentage points, and in four of them – more than 10.

6. In regions with an unstable group of leading companies it is necessary to build scenario forecasts of economic growth and structural dynamics or at least to check them for such a need. The analysis has shown that in 33 regions 5–6 companies in the top ten leaders have been replaced. At least 7 companies changed in 17 subjects of the country.

7. Given the importance of institutional factors in regional development, a methodology of institutional economic geography can be formed, covering the regularities of spatial change of institutions, their impact on the socio-economic indicators of regions, as well as institutional transformations occurring depending on the economic and social processes in the regional context.

References

Armand D.L., Preobrazhenskii V.S., Armand A.D. (1969). Natural complexes and modern methods of their study. *Izvestiya Akad. Nauk SSSR. Seriya Geograficheskaya,* 5, 5–16 (in Russian).

Baklanov P.Ya. (2013). Approaches and general principles of structurization of geographical space. *Izvestiya Rossiiskoi Akademii Nauk. Seriya Geograficheskaya,* 5, 7–18. DOI: 10.15356/0373-2444-2013-5-7-18 (in Russian).

Barbashova N.E., Gerasimova Yu.V. (2018). The problems of matching objectives, instruments, and financial flows in regional policy. *Mir novoi ekonomiki=The World of New Economy,* 3, 90–97. DOI: 10.26794/2220–6469-2018-12-3-90-97 (in Russian).

Blokhin A.A. (2019). Institutional rent in a multilevel economy. *Problemy prognozirovaniya=Studies on Russian Economic Development,* 4, 16–26. DOI: 10.1134/S 1075700719040026 (in Russian).

Blokhin A.A., Lomakin-Rumyantsev I.V., Naumov S.A. (2019). Alpha business in the Russian food market. *Ekonomicheskie strategii=Economic Strategies,* 6, 68–77. DOI: 10.33917/es-6.164.2019.68–77 (in Russian).

Bourdieu P. (2005). *Sotsial'noe prostranstvo: polya i praktiki* [Social Space: Fields and Practices]. Translated from French. Saint Petersburg: Aleteiya; Moscow: Institut eksperimental'noi sotsiologii.

Busenitz L.W., Gomez C., Spencer J.W. (2000). Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management Journal*, 43(5), 994–1003.

Fligstein N. (2013). *Arkhitektura rynkov: ekonomicheskaya sotsiologiya kapitalisticheskikh obshchestv XXI veka* [The Architecture of Markets: An Economic Sociology of 21st Century Capitalist Societies]. Moscow: Izd. dom Vysshei shkoly ekonomiki.

Freeman R.B. (2002). Institutional differences and economic performance among OECD countries. *CEP Discussion Papers dp0557.*

Frolov D.P. (2015). Do institutions matter in spatial economics? *Prostranstvennaya ekonomika=Spatial Economics,* 1, 14–37 (in Russian).

Granberg A.G. (2000). *Osnovy regional'noi ekonomiki* [Fundamentals of Regional Economics]. Moscow: GU VShE.

Ilyin V.A., Povarova A.I. (2017). Failures of big business tax administration and their impact on regional budgets. *Ekonomika regiona=Economy of Region,* 13(1), 25–37. Available at: https://www.elibrary.ru/download/elibrary_28807315_57727029.pdf (in Russian).

Klimanov V.V., Kazakova S.M., Yagovkina V.A. (2021). Tools of interregional cooperation in the public administration system. *Regionologiya=Russian Journal of Regional Studies,* 29(2), 250–282. DOI: 10.15507/2413-1407.115.029.202102.250–282 (in Russian).

Klyuev N.N. (2010). Russia's contrast as a threat to the country's territorial integrity. *Kontury global'nykh transformatsii: politika, ekonomika, pravo=Outlines of Global Transformations: Politics, Economics, Law,* 3(1), 18–29 (in Russian).

Kuvalin D.B. (2019). Modern problems of spatial development of Russia. In: *Strategiya i taktika realizatsii sotsial'no-ekonomicheskikh reform: regional'nyi aspekt: mat-ly viii mezhdunar. nauchn.-prakt. konferentsii* [Strategy and Tactics of Socio-Economic Reforms: Regional Aspect: Matters of the VIII International Scientific and Practical Conference]. Vologda (in Russian).

Leksin V.N., Shvetsov A.N. (2012). *Gosudarstvo i regiony: teoriya i praktika gosudarstvennogo regulirovaniya territorial'nogo razvitiya* [State and Regions: Theory and Practice of State Regulation of Territorial Development]. Moscow: Librokom.

Lugovoy O., Dashkeev V., Mazayev I. et al. (2007). *Analysis of Economic Growth in Regions: Geographical and Institutional Aspect*. Moscow: IET.

Lukin E.V. (2022). Regulation of interregional value chains: Problems of analysis and modeling. *Problemy prognozirovaniya=Studies on Russian Economic Development,* 1(190), 19–33. DOI: 10.47711/0868-6351-190-19-33 (in Russian).

Marchenko G.V., Machul'skaya O.V. (2000). Financial mechanisms for interregional equalization. *Finansy i kredit=Finance and Credit,* 1(61), 13–21 (in Russian).

Mikheeva N.N. (2021). Spatial Aspects of the Development of Economic Forecasts. In: Shirova A.A. (Ed.). *Nauchnyi doklad INP RAN* [Scientific Report. Institute of Economic Forecasting RAS]. Moscow: Artik Print (in Russian).

Minakir P.A. (2016). Institutional reflection of spatial development. *Prostranstvennaya ekonomika=Spatial Economics,* 4, 7–12 (in Russian).

Minakir P.A., Dem'yanenko A.N. (2010). Spatial economics: Evolution of approaches and methodology. *Ekonomicheskaya nauka sovremennoi Rossii=Economics of Contemporary Russia,* 3(50), 6–32 (in Russian).

Pappe Ya.Sh., Galukhina Ya. (2009). *Rossiiskii krupnyi biznes: pervye 15 let. Ekonomicheskie khroniki 1993–2008 gg* [Russian Big Business: The First 15 Years. Economic Chronicles of 1993–2008.]. Moscow: GU-VShE.

Perroux F. (1968). Les investissements multinationaux et 1'analyse des poles de developpement et des poles d'integration. *Revue Tiers-Monde*, 9(34).

Peterson M.F., van Iterson A. (2015). Differences in work goals among regions of the Netherlands and Germany: Functional, institutional and critical event influences. *The International Journal of Human Resource Management*, 26(2), 277–297.

Polterovich V.M. (1998). *Institutsional'nye lovushki i ekonomicheskie reformy* [Institutional Traps and Economic Reforms]. Moscow: Rossiiskaya ekonomicheskaya shkola.

Radaev V.V. (2011). *Komu prinadlezhit vlast' na potrebitel'skikh rynkakh: otnosheniya roznichnykh setei i postavshchikov v sovremennoi Rossii* [Who Owns the Power in Consumer Markets: The Relationship of Retail Chains and Suppliers in Modern Russia]. Moscow: Izd. dom Vysshei shkoly ekonomiki.

Savel'eva M.V. (2012). Unique advantages as the criteria of regions – "engines of growth". *Regional'naya ekonomika: teoriya i praktika=Regional Economics: Theory and Practice,* 2 (in Russian).

Schlevogt K.A. (2001). Institutional and organizational factors affecting effectiveness: Geoeconomic comparison between Shanghai and Beijing. *Asia Pacific Journal of Management*, 18(4), 519–551.

Sheppard E. (2008). *A Companion to Economic Geography*. John Wiley & Sons.

Vertogradov V.A. (2020). Alpha market strategies, beta and gamma in the context of theory economic dominance. *Ekonomicheskie strategii=Economic Strategies*, 2, 50–53. DOI: 10.33917/es-2.168.2020.50–53 (in Russian).

Wind B., Lersch P., Dewilde C. (2017). The distribution of housing wealth in 16 European countries: Accounting for institutional differences. *Journal of Housing and the Built Environment*, 32(4), 625–647.

Yaremenko Yu.V. (1981). *Strukturnye izmeneniya v sotsialisticheskoi ekonomike* [Structural Changes in the Socialist Economy]. Moscow: Mysl'.

Zubarevich N.V. (2014). Center and regions inter-budgetary relations: Economic and institutional aspects. *Zhurnal NEA=The Journal of the New Economic Association,* 3, 158–160 (in Russian).

Information about the Authors

Andrei A. Blokhin – Doctor of Sciences (Economics), Chief Researcher, Institute of Economic Forecasting, Russian Academy of Sciences (47, Nakhimovsky Avenue, Moscow, 117418, Russian Federation; e-mail: andraleks@rambler.ru); professor, Financial University under the Government of the Russian Federation (49, Leningradsky Avenue, Moscow, 125167, Russian Federation)

Aleksei A. Likhachev – degree-seeking applicant, Institute of Economic Forecasting, Russian Academy of Sciences (47, Nakhimovsky Avenue, Moscow, 117418, Russian Federation; e-mail: 79168346515@yandex.ru)

Received April 6, 2022.

DOI: 10.15838/esc.2022.4.82.5
UDC 332.12:001.84, LBC 65.049(2)

Socio-Economic Inequality of Regions in the Russian Federation: Measurement Issues and Long-Term Evaluation

Olga M.
SHATALOVA
Udmurt Branch of the Institute of Economics of the Ural Branch of the Russian Academy of Sciences
Izhevsk, Russian Federation
e-mail: oshatalova@mail.ru
ORCID: 0000-0002-0849-4231; ResearcherID: ABG-9458-2021

Ekaterina V.
KASATKINA
Kalashnikov Izhevsk State Technical University
Izhevsk, Russian Federation
e-mail: e.v.trushkova@gmail.com
ORCID: 0000-0001-6596-0086; ResearcherID: M-6863-2016

Abstract. The article is devoted to the problem of interregional differences in the economic area of the Russian Federation. The research covers a long period (from 1990 to 2020), since this period saw significant changes in the economic, institutional and political structure of the country. The assessment of the level of differences of regions is based on the main socio-economic indicators, data on which are formed in the system of state regional statistics. The Theil index was used as the basic method for measuring inequality. This made it possible to assess the dynamics of the spatial localization of economic activity in terms of the main socio-economic indicators, as well as form the groundwork for continuing the research – assessing its intragroup and intergroup components in the sectoral aspect. For a structural analysis of the problem of regional differences, we propose our own algorithm that allows us to form a discrete variation series and calculate the integral decile coefficient. The numerical implementation of the proposed algorithm made

For citation: Shatalova O.M., Kasatkina E.V. (2022). Socio-economic inequality of regions in the Russian Federation: Measurement issues and long-term evaluation. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 74–87. DOI: 10.15838/esc.2022.4.82.5

it possible to compile a multidimensional classification of regions according to the level of their economic activity and calculate the decile coefficient on this basis; the decile coefficient integrates the totality of the main socio-economic indicators adopted for the research. The results of the research show the long-term dynamics of the growth of differences and its significant level in comparison with the pre-reform period. A numerical assessment of the measure of differences, measured using the integral decile coefficient for a set of basic economic indicators of the regions, has been compiled. On this basis, it was found that in the long term (1995–2020) the level of economic differences of the regions increased from 2.4 to 5.6 times. A classification of regions according to the level of economic activity has been compiled, which reflects the nature of the differences of the regions of the Russian Federation, as well as the geography of the location of centers of concentration of economic activity.

Key words: regional economy, interregional differences, Theil index, integral decile coefficient, spatial localization, economic activity.

Acknowledgment

The article was prepared in accordance with the Program for Fundamental Scientific Research of the State Academies of Sciences and the research plan of the Institute of Economics of the Ural Branch of RAS for 2021–2023 on the topic "Methodology for innovation development of regionally oriented systems in an unstable economic environment".

Introduction

The *relevance* of the problem of socio-economic differentiation of regions is due to the fact that the high heterogeneity of regions impedes the establishment of a full-fledged economic space in the country, hampers the promotion of equal opportunities for the development of business and social environment in various RF constituent entities, entails inequality in the availability of public goods, etc. Economic heterogeneity of regions is due to the differences in climatic and geographical conditions, historically established industry specialization and production potential, as well as a number of other *objective* factors. At the same time, significant changes in the economic, institutional, and political structure of the country have led to the transformation of the spatial organization of the national economy and the strengthening of interregional differences.

Improving the territorial organization of the national economy and reducing interregional socio-economic imbalances is one of the important functions of state regional policy. The relevant problems and implementation tasks are declared, in particular, in the Spatial Development Strategy of the Russian Federation through to 2025[1] (hereinafter referred to as the "Strategy ...2025"). This policy document notes that "over the past ten years, as a result of the state regional development policy, there has been a reduction in interregional socio-economic imbalances".

In assessing interregional differentiation, not only the current state and medium-term trends are important. We should take into account that "in the early 1990s there was a significant increase in <...> differentiation" (Bakhtizin et al., 2017); this period witnessed significant political and socio-economic transformations, which also influenced the transformation of the country's economic space. Thus, in order to investigate the existing

[1] RF Government Resolution 207-r "On approval of the Spatial Development Strategy of the Russian Federation for the period through to 2025" dated February 13, 2019 (amended March 23, 2021). Available at: http://government.ru/docs/35733

interregional socio-economic imbalances, we should consider the corresponding thirty-year period from 1990 to 2020 as more representative. Such depth of research will, in our opinion, allow us to make a more thorough description of the national economic space and, in particular, to identify trends in interregional differences in the socio-economic situation of RF constituent entities and the dynamics of spatial localization (concentration) of economic activity in the country.

Interregional socio-economic differentiation has been addressed in many scientific publications by foreign and Russian economists. At the same time, we should note that though the methodological framework for measuring inequality is elaborated quite well, the question remains open as to the possibility of its application in the multidimensional space of the criteria of economic activity and socio-economic differentiation of the country's regions.

The purpose of the study is to conduct a long-term multidimensional assessment of economic inequality among Russian regions so as to reveal trends in the changing economic space of the country and identify new centers of concentration of economic activity. To achieve this goal, the following *tasks* were addressed:

– collecting and preprocessing the data on the chosen indicators of socio-economic situation in the regions;

– assessing the level of differentiation of the regions based on the Theil index calculated for the indicators we use here to assess the socio-economic situation of the regions; identifying long-term trends in the change of the country's economic space;

– calculating the *integral* indicator of regions' economic activity that summarizes all the features of their socio-economic situation; using this indicator to classify the regions by the level of economic activity;

– evaluating average (in the selected groups of regions) values of the economic characteristics under consideration to verify the quality of the classification and meaningful interpretation of the classification results;

– calculating the *integral* decile coefficient based on the compiled classification of the regions; the decile coefficient in this case represents a multidimensional numerical assessment of interregional differentiation in the totality of indicators of the socio-economic situation in the regions;

– graphical representation of the structure of the country's economic space based on the compiled multidimensional classification of the regions and displaying the geography of location of the centers of economic activity.

The *novelty* of our research findings consists in the development of methodological approaches to measuring economic inequality of regions and a long-term retrospective assessment of the structure of the country's economic space. When implemented, the proposed approaches add to the existing ideas about the nature of regional inequality, which is important for clarifying the policy aimed at the development of national economic space.

Methodological foundations and research methodology

Overview of methodological approaches to measuring interregional inequality

The issues of interregional inequality on the scale of the national economy are of considerable scientific interest to Russian and foreign economic scientists. Among the works most significant for our research, we should note the following.

An article by A.R. Bakhtizin, E.M. Bukhvald, A.V. Kolchugina (Bakhtizin et al., 2017) contains an overview of the norms of legal regulation of state regional policy in addressing the issues of economic levelling-off of RF regions. The paper presents numerical estimates of the scale of regional differentiation for the period from 1995 to 2014; the differentiation was measured on the basis of a decile coefficient calculated by specific economic indicators of the regions: GRP, the

volume of investments in fixed assets, the volume of production, and residents' income level. The article confirms the authors' hypothesis about the tendency toward strengthening interregional differentiation during economic recovery periods. Conclusions are formulated about the relevance of an integrated approach in the use of tools for the development of territories, selectivity (targeting) in the implementation of measures to equalize the economy of regions based on their classification according to acceptable criteria.

Works of E.A. Kolomak (Kolomak, 2014a; Kolomak, 2014b; Kolomak, 2020) contain estimates of regional differentiation formed on the basis of the Theil index, the coefficient of variation, and the Hirschman – Herfindahl index; differentiation measurements are compiled by volume economic indicators – GRP, population, number of employed – and the specific indicator of GRP per capita; and a study of spatial concentration factors is presented in regression models and by decomposition of the Theil index.

K.P. Glushchenko's works contain solutions on a methodology for measuring regional differentiation (Glushchenko, 2016; Glushchenko, 2018), and the results of assessing regional inequality in terms of income (Glushchenko, 2010).

Publications by N.V. Zubarevich (Zubarevich, 2014; Zubarevich, Safronov, 2014) are devoted to a wide range of issues of interregional inequality: estimates of regional differentiation in terms of income and employment are compiled; issues of improving the budget policy of economic alignment of regions are presented; the influence of institutional factors in the development of the economic space is described, etc. The author's empirical estimates are based on such indicators as the Gini index and the decile coefficient.

Publications of foreign researchers on the level and conditions of differentiation of the Russian economic space and proposed solutions on ways to ensure regional leveling-off development[2] are of great interest (Benini, Czyzewski, 2007). Our study also finds useful results in the foreign experience in addressing the problem of economic differentiation of regions to ensuring economic growth[3] (Obradović et al, 2016).

Publications of B.L. Lavrovskii and E.A. Shiltsin (Lavrovskii, Shiltsin, 2009; Lavrovskii, Shiltsin, 2016) reflect the essential aspects of interregional differentiation by individual socio-economic indicators: GRP, labor productivity, budget security. Differentiation estimates are based on the use of statistical measures of inequality – the coefficient of variation, the decile coefficient.

Of high methodological importance are the works of M.Yu. Malkina that reveal methodological features regarding the application of the main indicators of economic inequality of regions (Malkina, 2016a), as well as their application in the study of issues of state regional and budgetary policy (Malkina, 2014; Malkina, 2016b;).

The representativeness of modern research on the economic differentiation of regions indicates the high relevance of this scientific problem, as well as the formation of significant scientific experience of relevant measurements based on the general methodology of mathematical statistics in the study of the variation of a set of objects. At that, we should distinguish several groups of methods:

– *statistical indicators of variation*: the indicators "relative linear deviation", "coefficient of

[2] Blöchliger H., Durand-Lasserve O. (2018). The drivers of regional growth in Russia: A baseline model with applications. *Working Paper OECD for Conference "Monitoring the Russian Economy"*. Available at: https://one.oecd.org/document/ECO/WKP(2018)71/en/pdf

[3] Fournier J., Johansson A. (2016). The effect of the size and the mix of public spending on growth and inequality. *OECD Economics Department Working Papers*. No. 1344. Paris: OECD Publishing. Available at: http://dx.doi.org/10.1787/f99f6b36-en; Gal P., Egeland J. (2018). Reducing regional disparities in productivity in the United Kingdom. Organization for Economic Co-operation and Development. Available at: http://www.oecdilibrary.org/content/workingpaper/54293958-en

variation", etc. are presented. The methods within this group are characterized by high objectivity, but their use does not allow us to make an exhaustive description of the totality;

– *structural indicators of distribution*: they help to make a graphical interpretation of the distribution of objects in the aggregate and identify its features; as part of this group of methods, the decile coefficient has become widespread in studies of regional inequality;

– *concentration indicators*: designed to measure the degree of unevenness – the extent of concentration of the feature under consideration among the objects of the aggregate. As part of this group, the Gini index, the Hirschman – Herfindahl index, and the Lorentz coefficient have become the most applicable in modern studies of regional economics;

– *indicators of "general entropy"*: the corresponding group of measures of inequality of economic objects results from the transformation of C. Shannon's information entropy formula (entropy in this case is understood as a measure of randomness). The most applicable "entropy" indicators in economic research are the mean log deviation, the Theil index, and the Atkinson index.

The established methods of measuring inequality are used for individual indicators of economic activity such as GRP, population, population income, etc. However, the economic activity of regions is a complex category, and it is characterized by a set of indicators. The question of the composition of the indicators of economic activity of the regions is debatable. At the same time, we agree with the provisions that an important element of the strategy for reducing inequality consists in structural transformations and economic growth that contribute to increasing employment and labor incomes[4]; at the same time, practical application of this declaration requires using the indicators generated in the system of state statistical observations. Thus, it seems relevant to develop existing approaches to the study of economic inequality of regions based on *multidimensional analysis*, as well as the use of an appropriate *integral measure* of interregional differentiation.

In our study, we developed and tested a new algorithm for calculating the decile coefficient. The algorithm includes basic methods of mathematical statistics, provides for multidimensional data processing, analytical structuring of the variation spread according to criteria significant for the study. The space of classification criteria in this case includes a wide range of indicators of the socio-economic situation in regions that are essential for the study. The groups of regions formed in this way are statistically homogeneous, which provides the possibility of their meaningful interpretation and intergroup comparisons, as well as the possibility of using this grouping to calculate the integral decile coefficient.

Own research methodology

Within the framework of the study, we used two measures of inequality – the Theil index as a Generalized Entropy index of the second order (Theil, 1967) and the decile coefficient. We chose these indicators due to the following conditions:

– *using the Theil index* to assess the level of differentiation of regions, first, allows us to compare the results obtained with the results of previous studies (Bakhtizin et al., 2017; Kolomak, 2014a; Glushchenko, 2015; etc.); second, allows us to detail the estimates obtained, since the Theil index allows for the possibility of decomposition of its value (Theil, 1979; Adelman, Levy, 1984; etc.);

– *using the decile coefficient* makes it possible to make a structural characteristic of inequality in the economic space of the country; in this case, the category of "inequality" itself is considered in a complex manifestation as a result of the integration of a wide range of indicators of the socio-economic situation in regions.

[4] Combating Poverty and Inequality: Structural Change, Social Policy and Politics. Available at: https://cdn.unrisd.org/assets/library/publication-aux-pages/pdf-files/combating-poverty-and-inequality/povrep-small.pdf

We calculated the Theil index in two forms – for *volumetric* indicators of the socio-economic situation in regions ($GE(1)$) and for *specific* indicators ($GE_T(1)$).

$$GE(1) = \frac{1}{n}\sum_{j=1}^{n}\frac{x_j}{\bar{x}}\ln\frac{x_j}{\bar{x}}, \qquad (1)$$

where n is the number of objects of the studied population (the number of RF regions); x_j is the value of the estimated (main) volumetric indicator in region j; $\bar{x}$ is the average value of the estimated (main) volumetric indicator in the studied population.

$$GE_T(1) = \sum_{j=1}^{n}\frac{x_j}{X}\ln\frac{x_j/X}{p_j/P}, \qquad (2)$$

where X is the total value of the estimated (main) volumetric indicator for the studied set of regions: $X = \sum_{j=1}^{n} x_j$; p_j is the value of the normalizing volumetric indicator in region j; P is the total value of the normalizing volumetric indicator for the studied set of regions: $P = \sum_{j=1}^{n} p_j$. The normalizing indicator is understood as an indicator involved in calculating the specific value y_j for the main indicator x_j: $y_j = x_j/p_j$. The "population" indicator was adopted as a normalizing indicator.

The decile coefficient characterizing the ratio between the average values of the two extreme deciles in the studied set of objects, when measuring interregional differentiation, is usually calculated by the main indicator of the socio-economic situation of the regions – GRP per capita[5] (Bakhtizin et al., 2017; etc.). A methodologically significant issue when using this meter is to set the rule for structuring the scope of variation. When setting such a rule, a number of methods were developed: Sturges' rule, Scott's rule, Freedman – Diaconis rule, etc. (Orlov, 2013).

[5] Nikolaev I.A., Tochilkina O.S. (2011). Economic Differentiation of Regions: Estimates, Dynamics, Comparisons: Analytical Report. Available at: www.fbk.ru/upload/images/regions_doklad.pdf (accessed: March 1, 2022).

We calculated the *integral* decile coefficient (IDC), designed to solve two problems:

1) provide an integrated approach to measuring the level of inequality by integrating a set of key indicators of economic activity of regions (in specific representation):

$$\left\langle Y_j/P_j,\ FC_j/P_j,\ I_j/P_j,\ Pz_j/P_j,\ W_j\right\rangle, \qquad (3)$$

where Y_j is the volume of GRP; FC_j is the cost of fixed assets; I_j is the investments in fixed assets; Pz_j is the number of employed population; P_j is the number of population; W_j is the amount of accrued wages of employees of organizations in the region;

2) provide analytical grounds for dividing the scope of variation of the studied set of regions into significant classification groups.

The research methodology is disclosed by the following provisions.

1. *Data collection and preprocessing.* Our study used Rosstat data on the main socio-economic indicators of the economic activity of the regions. Preprocessing consisted mainly in calculating the specific values of these indicators (per capita).

2. *Numerical measurement and evaluation of the extent of regional differentiation*. The extent of differentiation was measured using the Theil index calculated for each of the socio-economic indicators of regions included in the study. The characteristic of interregional differentiation is formed on the basis of a study of the long-term dynamics of the Theil index.

3. *Structural analysis of interregional differentiation*. Performed using the IDC calculated on the basis of the following algorithm.

Step 1: normalization of specific indicators of economic activity (i) of regions (j); normalization is implemented by the linear method:

$$\eta_{ij} = \frac{y_{ij} - y_{i\min}}{y_{i\max} - y_{i\min}}, \qquad (4)$$

where η_{ij} is the normalized value of the indicator y_{ij}.

Step 2: calculation of the integral coefficient of economic activity of regions (ICEA) K_{EA} is carried out by means of additive convolution according to the indicators η_{ij}:

$$K_{EA\,j} = \sum_i \eta_{ij} \,. \quad (5)$$

Step 3: classification of regions by groups of economic activity:

1) splitting the scope of variation into minimum intervals $I_k^{\min}$:

$$I_k^{\min} = I_{k-1}^{\min} + \frac{K_{EA\max} - K_{EA\min}}{M}, \quad k = 1,...,M\,, \quad (6)$$

where M is the expert-defined number of groups (the value adopted in the framework of the study $M = 17$ was determined by the results of a numerical experiment); $I_0^{\min} = K_{EA}$ is the lower bound of the first minimum interval;

2) distributing the regions based on the ratio of their calculated values of ICEA with the resulting division into minimum intervals;

3) qualitative characteristics of the obtained distribution and combining intervals for small groups (with a frequency of less than five objects), aimed at increasing the statistical stability of the classification being formed;

4) checking the stability of the obtained solution using Sturges' rule (Sturges, 1926).

Step 4: calculation of the integral decile coefficient in the order adopted for the case of unequal intervals:

$$\text{IDC} = {D_9}/{D_1}\,,\ D_k = I_{i_k}^{\min} + \frac{h_{i_k}}{f_{i_k}}\left(\frac{kn}{10} - \sum_{i=1}^{i_k-1} f_i\right), \quad k = 1,...,9\,, \quad (7)$$

where $I_{i_k}^{\min}$ is the lower bound of the i_k interval containing the k-th decile; h_{i_k} is the width of the decile interval; f_{i_k} is the frequency of the decile interval; $\sum_{i=1}^{i_k-1} f_i$ is the sum of the accumulated frequencies preceding the decile interval.

The proposed algorithm is intended for the formation of a discrete variation series as the basis for a multidimensional classification of regions by level of economic activity, as well as for calculating the integral decile coefficient.

Results and discussion

The conducted research is based on the data of the state system of regional statistics[6]. The initial data set contains 13,410 records on the main socio-economic indicators of RF regions:

$$\left\langle Y_j, FC_j, I_j, Pz_j, W_j, P_j \right\rangle. \quad (8)$$

The data are arranged in the matrix $A = (x_{ij})$, where i is a socio-economic indicator, $i = \overline{1.6}$; j is a region, $j = \overline{1.82}$. The matrix A was formed for 1990 and for 1995–2020; since there is no information on the volume of GRP for 1990 in the published data of the state regional statistics, then the matrix A contains five indicators for this period.

The data set was used to calculate and evaluate two measures of interregional differentiation – the Theil index and the integral decile coefficient; also, on the basis of this data set, we compiled a classification of regions by level of their economic activity.

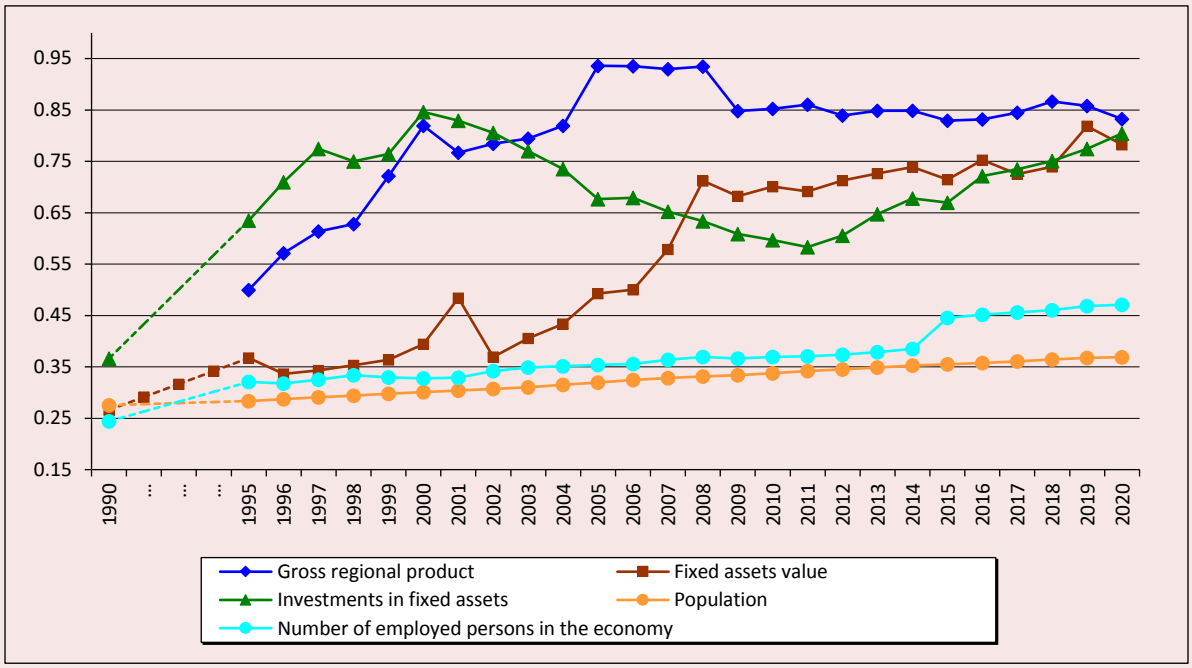
The Theil index as a measure of interregional differentiation.

The calculation of the Theil index was based on the absolute values of economic indicators Y_j, FC_j, I_j, Pz_j, P_j; the formula (1) was used. Interregional inequality was measured with the use of specific indicators ${Y_j}/{P_j}$, ${I_j}/{P_j}$; the Theil index in this case was calculated according to the formula (2).

The result of calculations is shown in *Figures 1* and *2*. The presented graphs reflect the dynamics of interregional differentiation over the period from 1990 to 2020.

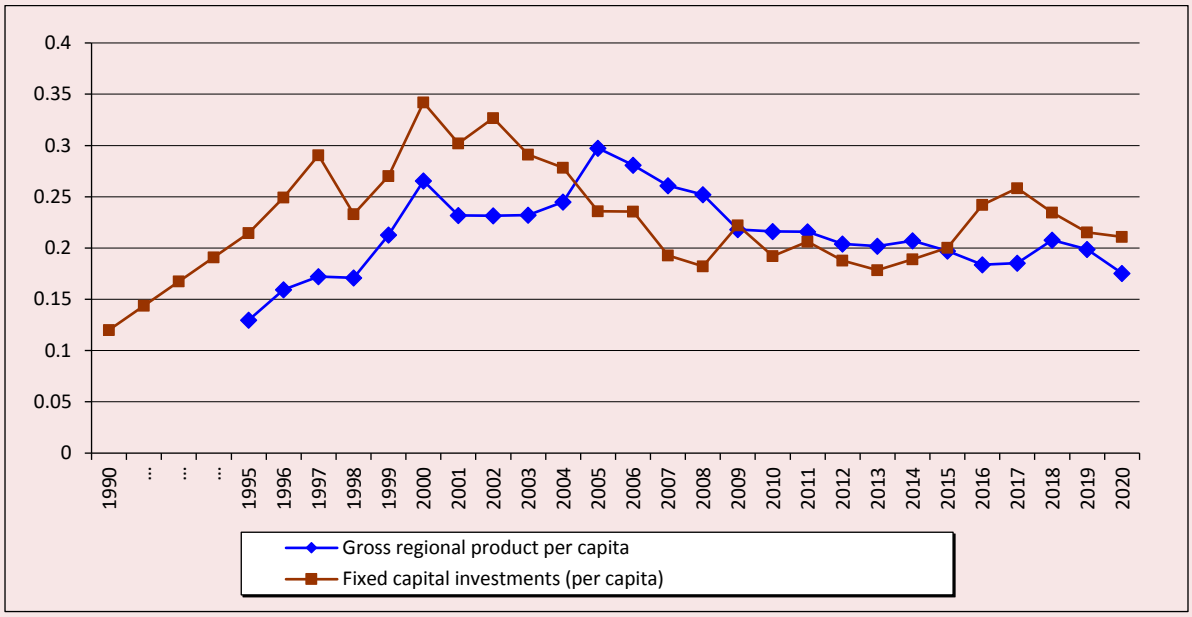
[6] Statistics collections "Regions of Russia. Socio-Economic Indicators..." (2003, 2011, 2018, 2021). Available at: https://rosstat.gov.ru/folder/210/document/13204; Section "Data Showcase". Available at: https://showdata.gks.ru/finder/ (accessed: March 1, 2022).

Figure 1. Dynamics of the Theil index according to the main socio-economic indicators of regions (in absolute terms)



Source: own calculation.

Figure 2. Dynamics of the Theil index according to the main socio-economic indicators of regions (in specific values)



Source: own calculation.

The long-term dynamics of the Theil index according to the main socio-economic indicators presented in Figures 1 and 2 allow us to draw a number of conclusions:

1) in the base year 1990, which can be attributed to the pre-reform period, there is a fairly low level of regional differentiation in the economic space of the country;

2) in the period up to 2000, there is a significant increase in regional inequality in terms of "investment in fixed assets", which subsequently (since 2001) is transformed into an increase in interregional differentiation in terms of the "value of fixed assets" indicator;

3) in terms of GRP, we can note a pronounced strengthening of interregional differentiation in the period from 1995 to 2008 – the level of the Theil index for this indicator reached 0.95 in 2008; this is 1/5 of the maximum value of this indicator (the maximum value of the Theil index is 4.4 and means such a conditional situation that all economic activity is concentrated in one center);

4) differentiation of regions in terms of "population" and "number of the employed" increased not so significantly in the period under consideration; such dynamics may be a consequence of low labor mobility and/or increased economic influence of economic sectors with low demand for labor resources (Zubarevich, Safronov, 2014; etc.);

5) the features of the differentiation calculated by specific indicators are increasing at a slower pace, but also indicate the existence of economic inequality in the regions.

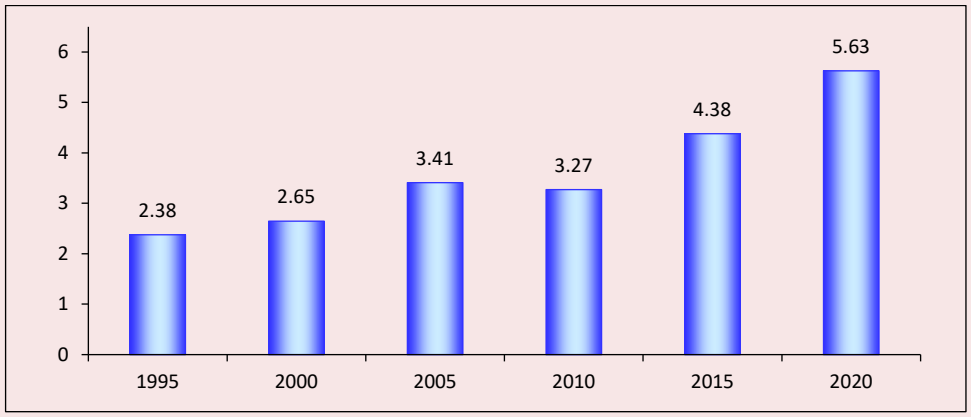
The problem of increasing inequality of regions requires studying the structural characteristics of the country's economic space, conducting numerical assessment of the structure of inequality, and designing a classification of regions according to the level of economic activity.

Structural analysis in the study of the concentration of economic activity

The study of structural features of the economic inequality of regions was carried out on the basis of the proposed algorithm (4) – (7). Using our own algorithm, we classified the regions and calculated the decile coefficient based on the integral indicator of economic activity ICEA. The evaluation of the ICEA was performed by means of additive convolution (5) of the normalized values of specific indicators, the composition of which is reflected in (3).

The ICEA served as a complex criterion for multidimensional classification of regions, compiled by dividing the population under consideration into seven statistically homogeneous groups of regions;

Figure 3. Values of the integral decile coefficient, a structural feature of economic inequality in Russian regions in 1995–2020



Source: own calculation.

we should note that the analytically determined number of intervals in the studied population corresponds to Sturges' rule. The compiled classification of regions according to the level of their economic activity served as the basis for calculating the decile coefficient for the years of the period under consideration. The integral decile coefficient calculated in this way represents a complex structural characteristic of the country's economic space. The result of IDC calculation is presented in the form of a diagram in *Figure 3*.

The values of the IDC confirm the estimates based on the Theil index about the increase in interregional differentiation. During the period

Parameters of the integral decile coefficient, a structural characteristic of economic inequality in Russian regions in 2020

Groups of regions, k	Interval of values of the integral coefficient of economic activity, $I_k^{\min} - I_k^{\max}$	Parameters of the integral decile coefficient										Number of regions, f_k	Composition of regions
		GRP per capita, million rub.		Share of employed persons		Volume of fixed assets per capita, million rub.		Volume of production investments per capita, million rub.		Average wage, thousand rub.			
		$\bar{y}_k$	V_k	$\bar{y}_k$	V_k	$\bar{y}_k$	V_k	$\bar{y}_k$	V_k	$\bar{y}_k$	V_k		
1	0.13–0.38	0.23	23%	0.35	9%	0.70	31%	0.06	30%	32.6	15%	9	Republic of Adygea, Republic of Dagestan, Republic of Ingushetia, Kabardino-Balkarian Republic, Chechen Republic, Karachay-Cherkess Republic, Republic of North Ossetia – Alania, Republic of Altai, Republic of Tyva
2	0.40–0.64	0.32	10%	0.41	6%	1.32	23%	0.06	38%	32.9	9%	15	Bryansk Oblast, Ivanovo Oblast, Kostroma Oblast, Oryol Oblast, Pskov Oblast, Republic of Kalmykia, city of Sevastopol, Mari El Republic, Chuvash Republic, Kirov Oblast, Saratov Oblast, Ulyanovsk Oblast, Kurgan Oblast, Altai Krai, Republic of Buryatia
3	0.66–0.91	0.41	15%	0.44	5%	1.64	22%	0.09	25%	36.9	12%	21	Vladimir Oblast, Kursk Oblast, Ryazan Oblast, Smolensk Oblast, Tambov Oblast, Tver Oblast, Novgorod Oblast, Republic of Crimea, Volgograd Oblast, Rostov Oblast, Stavropol Krai, Republic of Bashkortostan, Mordovia, Udmurt Republic, Orenburg Oblast, Penza Oblast, Republic of Khakassia, Kemerovo Oblast, Omsk Oblast, Zabaikalsky Krai, Jewish Autonomous Oblast
4	0.95–1.12	0.52	9%	0.47	5%	1.96	12%	0.10	18%	40.1	9%	16	Belgorod Oblast, Voronezh Oblast, Lipetsk Oblast, Tula Oblast, Yaroslavl Oblast, Karelia Republic, Kaliningrad Oblast, Krasnodar Oblast, Astrakhan Oblast, Perm Krai, Nizhny Novgorod Oblast, Samara Oblast, Sverdlovsk Oblast, Chelyabinsk Oblast, Novosibirsk Oblast, Tomsk Oblast
5	1.19–1.54	0.66	17%	0.46	7%	2.53	21%	0.16	25%	49.5	12%	10	Kaluga Oblast, Arkhangelsk Oblast, Vologda Oblast, Leningrad Oblast, Republic of Tatarstan, Irkutsk Oblast, Primorsky Krai, Moscow Oblast, Krasnoyarsk Krai, Khabarovsk Krai
6	1.83–2.28	0.91	24%	0.51	9%	3.74	25%	0.24	44%	68.4	18%	7	Komi Republic, Amur Oblast, Murmansk Oblast, Saint Petersburg, Republic of Sakha (Yakutia), Kamchatka Krai, Tyumen Oblast
7	3.01–4.55	2.00	15%	0.63	8%	4.65	56%	0.46	36%	96.2	21%	4	Moscow, Magadan Oblast, Sakhalin Oblast, Chukotka Autonomous Okrug

Source: own calculation.

under consideration, the difference between the extreme deciles of the country's regions increased from 2.4 to 5.6 times. Since the decile coefficient is an integral measure of interregional inequality in the multidimensional space of criteria, it is important to understand its internal content – the composition of the parameters taken into the assessment of the IDC. The *table* shows data for 2020 on the interval values of the ICEA by classification groups of regions, as well as on the parameters of its constituents – in the form of average estimates $\bar{y}_k$ and the coefficient of variation V_k.

According to the data from the table, the following main conclusions can be made:

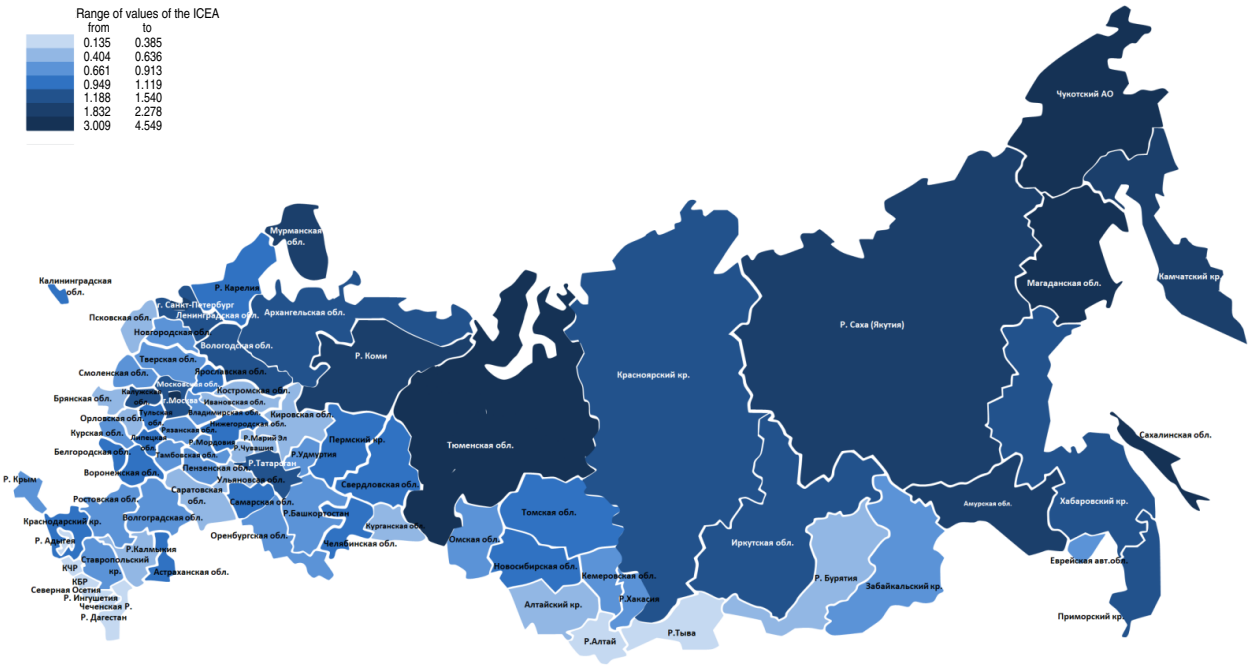
– the classification of regions compiled on the basis of our own algorithm made it possible to obtain statistically homogeneous groups; this, first, confirms the validity of the classification obtained, and second, allows for a meaningful interpretation of each group of regions and an assessment of intergroup differences;

– the numerical values of ICEA parameters indicate a really high differentiation of the existing groups of regions: the average estimates of the parameters show an 8-fold difference in the specific volume of investments, 8.6-fold difference in the level of GRP, 6.7-fold difference in the specific volume of fixed assets;

– the groups with the highest concentration of economic activity – (7) and (6) – include regions with single-industry economic specialization in the extractive industry (Shatalova et al., 2022), as well as Saint Petersburg and Moscow. We should note that the high values of specific indicators in terms of GRP, investments, fixed assets (normalized by population) in such regions as the Magadan Oblast, the Sakhalin Oblast and Chukotka Autonomous Okrug are partly due to the small number of people permanently residing in these regions; the combined population of these three regions is 0.5%, at the same time, their "contribution" to the total volume of GRP and investments in the Russian Federation is 1.50% and 1.45%, respectively;

– the regions specializing in the manufacturing sector belong mainly to groups (3) and (4), that is, they do not have pronounced signs of concentration of economic activity; except for the Kaluga Oblast, the Leningrad Oblast and the Republic of Tatarstan, which are included in group (5).

Figure 4. The structure of the country's economic space according to the level of concentration of economic activity of regions (2020)



Thus, according to the results of the study, we conclude that during the thirty-year period under consideration, there has been a tendency toward increasing interregional inequality in the economic space of the country, with the primary sector becoming more important (the "primary sector" is defined in accordance with the theoretical concept of the Fisher – Clark three-sector model (Fisher, 1939)).

In order to provide a visual representation of the compiled classification of regions, we designed a color chart that shows the structure of the country's economic space according to the level of concentration of economic activity *(Fig. 4)*.

The color chart clearly shows the nature of the differentiation of RF regions and the geography of the centers of concentration of economic activity.

Conclusion

The research presented in the article is aimed at assessing the inequality of Russian regions in a long-term retrospective. To solve the research task, we used the established statistical methods for measuring inequality, including the calculation of the Theil index and the decile coefficient. To adapt the existing methods of structural analysis of variation to the specifics of the study, we proposed an algorithm for calculating the integral decile coefficient and the formation of a discrete variation series. The numerical implementation of the proposed algorithm made it possible to compile a multidimensional classification of regions according to the level of their economic activity and calculate on this basis a decile coefficient integrating the totality of the main socio-economic indicators.

The main results of the study are summarized as follows:

– based on the calculation of the Theil index for the main socio-economic indicators, we show a long-term trend toward increasing differentiation of regions compared to the pre-reform period; the differentiation of regions is especially significant according to the following indicators: the volume of GRP, the volume of production investments, the cost of fixed assets;

– structural features of regional inequality, measured using the integral decile coefficient, also indicate negative changes in the economic space of the country – the differentiation of the economic condition of the regions included in the extreme deciles increased from 2.4 to 5.6 times the level;

– the classification of regions carried out on the basis of our own algorithm shows that the concentration of economic activity is shifting toward the extractive industry sector (mainly to the regions of Siberia and the Far East), as well as the cities of Moscow and Saint Petersburg. The regions whose economic specialization is focused on high-tech industries usually do not have a pronounced concentration of economic activity.

The results obtained are consistent with the provisions of earlier studies conducted by Russian economists (Bakhtizin et al., 2017; Kolomak, 2014a; Glushchenko, 2015, etc.) on the high importance of the problem of economic inequality in Russian regions and the relevance of an effective state policy of levelling-off development. At the same time, within the framework of the research, we studied a long-term retrospective and revealed an increase in the level of inequality in comparison with the pre-reform period. Our own algorithm for estimating the decile coefficient develops the established methods for measuring regional differentiation: it helps to make an integral assessment of interregional differentiation according to the totality of the main socio-economic indicators and to reveal its structural component.

We see the practical significance of our research findings in the possibility of using them in the implementation of state regional policy, one of the directions of which is defined as "reducing the level of interregional differentiation in the socio-economic development of RF constituent entities and reducing intraregional socio-economic

differences"[7]. The solution of the relevant tasks requires monitoring and control of the results achieved in the implementation of measures for leveling-off the development of territories. However, the set of spatial development targets contained in the current edition of "Strategy ...2025" does not include necessary indicators for measuring economic inequality of the country's regions. In this regard, it seems necessary to supplement this set of indicators on the basis of modern achievements of economic science and world experience.

Taking into account the urgency of the problem of interregional differentiation in the country and the wide possibilities of the methodological framework for its study, we find it important to continue the study in the following areas: quantitative and qualitative assessment of the impact of the established centers of economic growth on economic convergence within the respective macro-regions; assessment of the nature of interregional differentiation in the context of industry clusters; identification of centers of spatial localization of industry production systems; conducting cross-country comparisons and researching foreign experience in reducing economic inequality of regions in the context of the neo-industrial imperative of economic growth.

References

Adelman I., Levy A. (1984). Decomposing Theil's index of income in equality into between and within component. *The Review of Income and Wealth*, 30(32), 119–121.

Bakhtizin A.R., Bukhval'd E.M., Kol'chugina A.V. (2017). Economic differentiation of regions of Russia: New estimates and patterns. *ETAP: ekonomicheskaya teoriya, analiz, praktika=ETAP: Economic Theory, Analysis, Practice,* 1, 41–56 (in Russian).

Benini R., Czyzewski A. (2007). Regional disparities and economic growth in Russia: New growth patterns and catching up. *Econ Change*, 40, 91–135. DOI: 10.1007/s10644-007-9026-0.

Fisher A.G.B. (1939). Production, primary, secondary and tertiary. *Economic Record*, 15(1), 24–38. Available at: https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1475-4932.1939.tb01015.x.

Gluschenko K. (2018). Measuring regional inequality: To weight or not to weight? *Spatial Economic Analysis*, 13(1), 36–59.

Glushchenko K.P. (2010). Income inequality in Russian regions: comparative analysis. *Region: Ekonomika i Sotsiologiya=Region: Economics and Sociology,* 4, 88–119 (in Russian).

Glushchenko K.P. (2016). On the issue of application of the Gini coefficient and other inequality indices. *Voprosy statistiki,* 2, 71–80 (in Russian).

Kolomak E.A. (2014a). Spatial concentration of economic activity in Russia. *Prostranstvennaya ekonomika=Spatial Economics,* 4, 82–99 (in Russian).

Kolomak E.A. (2014b). Evolution of the spatial distribution of economic activities in Russia. *Region: Ekonomika i Sotsiologiya=Region: Economics and Sociology,* 3(83), 75–93 (in Russian).

Kolomak E.A. (2020). Transformation of spatial proportions of modern Russia's development: Directions, rates, factors. *Interekspo Geo-Sibir',* 3(1), 88–95 (in Russian).

Lavrovskii B.L., Shil'tsin E.A. (2009). Russian regions: Convergence or stratification? *Ekonomika i matematicheskie metody=Economics and Mathematical Methods,* 45(2), 31–36 (in Russian).

Lavrovskii B.L., Shil'tsin E.A. (2016). Gross regional product of Russian regions in last years: Dynamic and spatial configuration. *Ekonomika regiona=Economy of Region,* 12(2), 383–395 (in Russian).

[7] RF Government Resolution 207-r "On approval of the Spatial Development Strategy of the Russian Federation for the period through to 2025" dated February 13, 2019 (amended March 23, 2021). Available at: http://government.ru/docs/35733

Malkina M.Yu. (2014). Study of the relationship between the development level and degree of income inequality in the Russian regions. *Ekonomika regiona=Economy of Region,* 2, 238 (in Russian)

Malkina M.Yu. (2016a). On the issue of weighting in interregional studies (in response to K.P. Gluschenko). *Prostranstvennaya ekonomika=Spatial Economics,* 1, 163–184 (in Russian).

Malkina M.Yu. (2016b). Evaluation of the factors of Russian regions' convergence/divergence in the level of budget provision based on the decomposition of the Theil – Bernoulli Index. *Prostranstvennaya ekonomika=Spatial Economics,* 3, 16–37 (in Russian).

Obradović S., Lojanica N., Stančić O. (2016). The influence of economic growth on regional disparities: Empirical evidence from OECD countries. *Zb. Rad. Ekon. Fak. Rij*, 34(1), 161–186. DOI: 10.18045/zbefri.2016.1.161.

Orlov Yu.N. (2013). Optimal histogram partitioning for estimating the sample density of the distribution function of a nonstationary time series. *Preprinty IPM im. M.V. Keldysha=Keldysh Institute Preprints,* 14. Available at: http://library.keldysh.ru/preprint.asp?id=2013-14 (accessed: March 1, 2022; in Russian).

Shatalova O.M., Kasatkina E.V., Livshits V.N. (2022). Cluster analysis and classification of industrially oriented regions of the Russian Federation by economic specialization. *Ekonomika i matematicheskie metody=Economics and Mathematical Methods,* 58(1), 80–91 (in Russian).

Sturges H. (1926). The choice of a class-interval. *J. Amer. Statist. Assoc.*, 21, 65–66.

Theil H. (1967). *Economics and Information Theory*. Amsterdam: North-Holland.

Theil H. (1979). The measurement of inequality by components of income. *Economics Letters*, 2(2), 197–199.

Zubarevich N.V. (2014). Regional development and regional policy in Russia. *EKO=ECO,* 4(478), 6–27 (in Russian).

Zubarevich N.V., Safronov S.G. (2014). Spatial inequality of income in Russia and large post-Soviet countries. *Regional'nye issledovaniya,* 4(46), 100–110 (in Russian).

Information about the Authors

Olga M. Shatalova – Doctor of Sciences (Economics), Associate Professor, Senior Researcher, Udmurt Branch of the Institute of Economics of the Ural Branch of the Russian Academy of Sciences (4, Lomonosov Street, Izhevsk, 426004, Russian Federation; e-mail: oshatalova@mail.ru)

Ekaterina V. Kasatkina – Candidate of Sciences (Physics and Mathematics), Associate Professor, associate professor of department, Kalashnikov Izhevsk State Technical University (7, Studen'cheskaya Street, Izhevsk, Udmurt Republic, 426069, Russian Federation; e-mail: e.v.trushkova@gmail.com)

Received May 11, 2022.

DOI: 10.15838/esc.2022.4.82.6
UDC 332.12, LBC 65.050.23

Priorities and Tools for the Transformation of Municipal Governance in the Context of the New Reform of Local Self-Government

Sergei G.
ZHESTYANNIKOV
Representative Assembly of Vologodsky Municipal District
Vologda, Russian Federation
e-mail: jestyannikovsg@volraion.ru

Abstract. One of the priority areas in the development of municipal formations in the context of the new reform of local self-government in Russia is the transformation of the system of local self-government, including further consolidation of territorial systems at the municipal level. These issues are to a certain extent reflected in scientific studies and in the research on agglomeration processes as well. At the same time, in the methodological aspect, insufficient attention is paid to the transformation of municipal governance. We believe it is necessary to focus not only on general patterns, but also on the specifics of development of municipal formations located around a large city; these provisions have determined the relevance of the work. The purpose of our study is to develop a methodological approach to substantiating priorities and tools for the transformation of municipal governance in the context of the new reform of local self-government. To this end, we use methods such as analysis and synthesis, structural, functional, monographic, statistical methods, review of municipal practices, etc. Scientific novelty of the research lies in the development of a methodological approach to substantiating priorities and tools for the transformation of municipal governance in the context of the new reform of local self-government. We show that transformation methods such as unification of rural settlements and transition to a single-level system of organization of local self-government, transfer of powers from the level of rural settlement to the level of municipal district, development of inter-municipal cooperation provide positive socio-economic effects for municipal formations. The findings of our work can be replicated and used in the practice of

For citation: Zhestyannikov S.G. (2022). Priorities and tools for the transformation of municipal governance in the context of the new reform of local self-government. *Economic and Social Changes: Facts, Trends, Forecast,* 15(4), 88–101. DOI: 10.15838/esc.2022.4.82.6

managing the development of municipal formations in Russia; they can also serve as a basis for further research on this topic concerning the improvement of the management system at the local level.

Key words: municipal formations, local self-government, local self-government reform, urban agglomerations, inter-municipal cooperation.

Introduction

Modern trends in the development of municipalities associated with the presence of socio-economic and institutional and management problems, the need to build an integrated system of strategic management of territorial development, greater consideration of the potential of the local community and resource base, make it important to develop methodological approaches to ensure a balanced development of the territory. One of the directions of its achievement is the transformation of municipal management, providing a set of solutions to optimize organizational management structures and reduce asymmetry in the socio-economic development of municipalities, primarily those that are the nearest periphery in the urban agglomeration.

Active interaction of large cities with a population of 250 thousand people and the surrounding areas within a radius of 50–60 kilometers, their organizational, economic and cultural integration provide a significant multiplier effect for the development of both the city and the surrounding municipalities. Their role in the regional aspect is, on the one hand, to ensure the strengthening of inter-municipal cooperation, allowing the effective use of labor, organizational, financial, recreational and other resources to meet the challenges of urban development, on the other hand, to ensure the translation of urban dynamics of socio-economic changes in the peripheral areas.

The above-mentioned guidelines are defined in a number of strategic documents of the country's development. Thus, according to the "Strategy for spatial development of the Russian Federation for the period through to 2025" the most important goal is to reduce the level of inter-regional differentiation in socio-economic development of the constituent entities in the Russian Federation, including by increasing the sustainability of the settlement system through the development of supporting settlements, rural areas, taking into account population density, different development and use of such territories, natural conditions, distance from large cities, etc.[1]

According to the "Fundamentals of state policy for regional development of the Russian Federation through to 2025" a priority task is the need to ensure economic connectivity of cities with their surrounding areas, as well as urban agglomerations with each other, reducing disparities in quality of life in urban and rural areas[2].

These priorities were further developed in the updated Constitution of the Russian Federation, the Federal Law 414-FZ "On the general principles of organization of public authority in the constituent entities of the Russian Federation", dated December 21, 2021, Draft Law 40361-8 "On the general principles of organization of local authority in the unified system of public authority" (passed in the first reading on January 25, 2022). The next stage of the municipal reform is designed to increase the efficiency of interaction between all levels of public authority for the socio-economic development of territories through the transition to a new spatial organization of regions based on a single-level model of local self-government[3].

[1] "On the strategy for spatial development of the Russian Federation for the period through to 2025": Government Order 207-r, dated February 13, 2019.

[2] "On the fundamentals of state policy for regional development of the Russian Federation through to 2025": Presidential Decree 13, dated January 16, 2017.

[3] "On the general principles of organization of local authority in the unified system of public authority": Draft Federal Law. Available at: https://sozd.duma.gov.ru/bill/40361-8

Thus, the consideration of trends and problems in the transformation of municipal governance in the conditions of local government reform is relevant for the substantiation of managerial approaches to the optimization of organizational structures and reduction of asymmetry in the socio-economic development of municipalities.

Literature review

During the search for effective ways of socio-economic development of territories, foreign and Russian scientists note different methods of managing the development of municipalities: economic, financial, administrative, regulatory, program-oriented, etc. The subjects of governance in this context are the bodies of local government and the population of the municipality. The subjects of direct or indirect influence on the development of municipalities can also include public authorities, business structures, and the non-profit sector. The object of management is the municipality as a socio-economic system of spatial type. *Table 1* presents examples of classifications of methodological tools.

The available classifications do not fully reflect current trends in the development of municipalities, aimed at solving the problems of governance transformation in the conditions of local self-government reform. In this regard, we note positively the research of T.V. Uskova, N.V. Voroshilov (Uskova, Voroshilov, 2015), which considers the formation of socio-economic districts to eliminate territorial imbalances as a regulatory tool. The importance of the application of these methods in conditions of limited resources is also noted by other authors (Oreshnikov, Ataeva, 2018).

The generalization of approaches to the management of municipal development resulted in our original classification (*Tab. 2*).

Within the framework of the article we have analyzed the methods of municipal-territorial and spatial development, including changes in the type and boundaries of municipalities, as well as inter-municipal cooperation, which allow for socio-economic development of the municipality, taking into account the location factor and opportunities for resource sharing.

Scientific approaches to the organization of inter-municipal cooperation have been studied by both foreign (Casula, 2020) and Russian scientists (Gainanov et al., 2017) and enshrined in legal acts[4]. At the same time, at present, the practice of applying inter-municipal interactions is implemented at the local level fragmentarily. Depending on the

Table 1. Classification of municipal development management methods elaborated in the scientific literature

Author	Methods	Tools
D.S. Khairullov (Khairullov, 2019)	Economic	Direct: budget financing, centralized capital investments, setting tariffs and prices for services and goods; indirect: local taxes, payments for the use of natural resources, lease of municipal property, etc.
	Administrative	Regulatory framework
T.V. Uskova, N.V. Voroshilov (Uskova, Voroshilov, 2015)	Financial	Subsidies, grants, subventions, tax incentives, subsidies for training, expertise of development projects and budgets
	Organizational	Providing consulting services
	Administrative	Formation of socio-economic districts to eliminate territorial disparities; improvement of the regulatory framework
I.M. Pavlenkov (Pavlenkov, 2018)	Financial	Direct financial instruments – financial aid from budgets of different levels
	Non-financial	Gratuitous transfer or sale at a discounted cost of municipal or state property; development of infrastructure (water supply, roads, sewerage, etc.), subsidies from the budget for professional development and training of specialists, etc.
Source: own compilation based on a literature review.		

[4] "On the general principles of the organization of local self-government in the Russian Federation": Federal Law 131-FZ, dated October 6, 2003.

Table 2. Classification of methods and tools for managing the development of municipalities

Methods	Tools
Financial	Budget financing (including transfers, subsidies, subventions, grants), municipal loans
	Extrabudgetary funds
	Co-financing the participation of municipalities in national projects
Economic	Creation of economic and administrative zones with special status (technology parks, science cities, single-industry towns, territorial development zones, territories of advanced economic development, etc.), clusters
	Tariff, price and tax regulation
	Management of municipal real estate
	Support for small businesses, including through municipal orders, grant support, and incentives
	Attracting investment
	Municipal-private partnership
Regulatory and administrative	Municipal regulations
	Development and implementation of strategies, programs
	Project management
	Territorial marketing
	Municipal management consulting, advanced training
	Development of social and economic standards
Regulating the public mood	Digitalization of municipal management and service delivery
	Providing socially important services
	Audit and openness to the public of the results of municipal government
	Development of forms of public participation, including initiative budgeting, territorial self-government
Municipal-territorial and spatial development	Changing the type and boundaries of municipalities
	Intermunicipal cooperation
Source: own compilation.	

goals and organizational and legal content, inter-municipal cooperation can take the forms of associative and contractual, and less often economic cooperation (Voroshilov, 2021a; Voroshilov, 2021b). However, we should note that, along with inter-municipal cooperation, there are other methods of municipal development, including municipal-private partnerships, project management, etc.

Inter-municipal cooperation is an effective method of combining the resources of different municipalities to address issues and problems of local importance, as well as the implementation of major investment projects requiring greater coordination of joint actions, which is especially important for the effective management of the municipalities development that are part of urban agglomerations, to ensure the economic recovery of all its components, not just the "center" (Fang, 2019; Dadashpoor, Ahani, 2019; Kössler, Kress, 2021).

Researchers (Shmidt et al., 2016; Li et al., 2020; Zidong, Xintao, 2021) have argued that large cities should act as innovation centers in relation to the territory to which their political, administrative, cultural and economic influence extends. The transport and communication base of the support framework is a complex of infrastructure corridors, economic axes, along which the bands of population and economy concentration are formed.

In the context of the above changes in the territorial structure, a further transition to a single-level organization of local self-government seems logical[5].

[5] On amendments to the federal law "On the general principles of the organization of local self-government in the Russian Federation": Federal Law 62-FZ, dated April 3, 2017; on amendments to the federal law "On the general principles of the organization of local self-government in the Russian Federation": Federal Law 87-FZ, dated May 1, 2019; "On the general principles of the organization of public authority in the constituent entities of the Russian Federation": Federal Law 414-FZ, dated December 21, 2021.

Centralization as a current trend of municipal development in Russia, the need for scientific approaches to territorial and spatial changes, including agglomeration, has been studied by many Russian scientists on the examples of particular regions (Dement'ev, 2019; Sirazhdinov, 2021).

A number of scientific papers, including those based on materials of the Northwestern Federal District (Mishchenko et al., 2020; Korechkov et al., 2021), assess the legal, organizational, and socio-economic aspects of the municipal reform of transition to a single-level system of local self-government and develop recommendations to help the authorities and the population adapt to the forthcoming changes. As the positive aspects of the reform, the researchers identified and justified the potential to increase the budget revenues of the district, the optimization of staff and costs for the organization of management, paperwork and regulatory framework, improving organizational efficiency, the unity of territorial planning documents and property management complex. Some negative aspects include possible protest activity, the need to hire employees of the administrations of settlements, and the "remoteness" of government and municipal services from the population.

Methods and data

The study was carried out with the help of methods of analysis and synthesis, structural and functional, monographic method, tools of statistical analysis, the study of municipal practices, etc.

The conclusions and suggestions are substantiated by an analysis of Rosstat data, information on local budget execution (Database of municipal indicators, Rosstat), the regulatory and legal framework in the field of the new local self-government reform in Russia, and the practice of municipal transformation and municipal governance (Internet data).

Findings

Analysis of the local government experience in foreign countries and Russia shows that the period of the second half of the 20th century and the early 21st century is associated with active transformation at the local level. One of the main trends was the enlargement of municipalities, as well as the transition to a single-level model of local government, the inevitable reasons for which many authors consider changes in the settlement system, the concentration of economic growth and human capital in cities, and the reduction in the rural population (Burkova, 2013; Kuznetsov et al., 2019; Bukhval'd et al., 2021). Amendments made to the federal law "On the general principles of the organization of local self-government in the Russian Federation", since 2017 have established the possibility of transforming municipal districts into urban districts, and since 2019 – into municipal districts[6].

On the basis of changes in the legal framework, the most significant transformations toward the enlargement of municipalities by uniting rural settlements took place in the Leningrad, Vologda, Kaliningrad oblasts and the Komi Republic (*Tab. 3*). At present, the processes of transition to the formation of municipal districts are under way in most of the constituent entities of Northwest Russia. Transition to a single-level system of local self-government has been completed in the Kaliningrad Oblast[7].

[6] "On the general principles of the organization of local self-government in the Russian Federation": Federal Law 131-FZ, dated October 6, 2003.

[7] "On the regulation of certain issues related to the granting of the status of a municipal district to certain urban districts of the Kaliningrad Oblast": Law of the Kaliningrad Oblast 378, dated December 27, 2019.

Table 3. Number of municipalities in the Northwestern Federal District in 2017–2020 by type of municipality (excluding the federal city of Saint Petersburg)

Constituent entity	Total		MD*		UD**		US***		RS****		MO*****	
	2017	2021	2017	2021	2017	2021	2017	2021	2017	2021	2017	2021
Northwestern Federal District	1322	1247	146	137	53	56	206	195	917	853	0	6
Republic of Karelia	126	125	16	16	2	2	22	22	86	85	0	0
Komi Republic	185	178	14	14	6	6	14	14	151	144	0	0
Arkhangelsk Oblast, including:	226	218	20	19	8	8	21	20	177	170	0	1
Nenets Autonomous Okrug	21	21	1	1	1	1	1	1	18	18	0	0
Vologda Oblast	218	207	26	26	2	2	22	21	168	158	0	0
Kaliningrad Oblast	32	22	3	0	19	22	6	0	4	0	0	0
Leningrad region	217	205	17	17	1	1	64	66	135	121	0	0
Murmansk Oblast	40	36	5	4	12	12	13	10	10	9	0	1
Novgorod Oblast	142	120	21	17	1	1	19	17	101	81	0	4
Pskov Oblast	136	136	24	24	2	2	25	25	85	85	0	0

* Municipal district; ** urban district; *** urban settlement; **** rural settlement; ***** municipal okrug.
Source: compiled according to database of municipal indicators. *Rosstat*. Available at: http://www.gks.ru/dbscripts/munst/munst.htm

In the Vologda Oblast in 2017, the consolidation of municipalities occurred in five municipal districts. We chose Vologodsky Municipal District as the object of closer attention[8].

Vologodsky Municipal District is one of the developed and large agricultural districts in the region. As of January 1, 2022, it is administratively divided into 10 rural settlements. The district has a favorable economic and geographical location around the administrative center of the region and is part of the Vologda agglomeration. The organizational efficiency of local government allows the implementation of a number of effective municipal practices. In 2018–2021, Vologodsky District ranked 1st in the regional ratings of municipal districts in the Oblast based on the results of the effectiveness evaluation of local self-government bodies carried out in accordance with RF Presidential Decree 607 "On the evaluation of the effectiveness of local self-government bodies of urban districts and municipal districts", dated April 28, 2008.

The district is typical for the consideration of problems and prospects of spatial changes of municipal entities in Northwest Russia in the context of the local self-government reform (*Tab. 4)*.

Table 4. Population of large cities of Northwest Russia and the municipalities located near them (2021), people

№	Large city	Population	Municipality located near the large city	Population	RF constituent entity
1.	Kaliningrad	482,443	Guryevsky District	68,579	Kaliningrad Oblast
2.	Arkhangelsk	348,343	Primorsky District	24,278	Arkhangelsk Oblast
3.	Cherepovets	316,529	Cherepovetsky District	38,635	Vologda Oblast
4.	Vologda	311,846	Vologodsky District	51,999	Vologda Oblast
5.	Murmansk	292,465	Kolsky District	40,293	Murmansk Oblast
6.	Petrozavodsk	280,170	Prionezhsky District	21,931	Republic of Karelia
	Total	2,031,796		245,715	

Source: compiled according to database of municipal indicators. *Rosstat*. Available at: http://www.gks.ru/dbscripts/munst/munst.htm

[8] On the transformation of some municipalities of Vologodsky Municipal District and on amendments to the regional law "On establishing the borders of Vologodsky Municipal District, the boundaries and status of the municipalities that are part of it": Vologda Oblast Law 4148-OZ, dated May 29, 2017.

The scientific literature contains ambiguous assessments regarding the consequences of the municipalities' junction for the socio-economic development of territories. A case in point is the lack of a positive effect from the unification of rural settlements in the Kichmengsko-Gorodetsky District of the Vologda Oblast, which is presented in the study (Voroshilov, 2017). The scientist's conclusion about the need to transform the municipal-territorial structure on the basis of a comprehensive feasibility study with clearly defined quantitative and qualitative criteria and the real effectiveness of the processes is fair. This conclusion may be supplemented by a decision, based on a comprehensive analysis of the territory's development level, on the insufficiency of this measure for a depressed area and the need for additional comprehensive measures of state regulation.

The analysis of the consequences related to the unification of rural settlements in Vologodsky Municipal District reveals a positive trend, as evidenced by the data on the execution of the budgets of Markovskoe and Podlesnoe rural settlements for 2017 and Podlesnoe rural settlement for 2021 (*Tab.* 5). As the main effects, we point out:

– increasing the investment attractiveness of the united settlement and, as a consequence, increasing the taxable base for personal income tax by 177% compared to the level of 2017;

Table 5. Analysis of budget execution of Markovskoe and Podlesnoe rural settlements for 2017 and Podlesnoe rural settlement for 2021, thousand rubles

Indicator	2017		2021
	MRS*	PRS**	PRS***
Execution of revenues:			
Tax and non-tax revenues	2 740.07	6 189.77	12 987.90
Personal income tax	207.07	1 315.31	2 706.80
Unified agricultural tax	3.05	0.00	0.00
Personal property tax	701.55	1 301.22	2 428.24
Land tax	1 481.85	3 477.41	6 584.35
State duty	27.64	38.14	25.59
Debts and recalculation of taxes, fees and other obligatory payments cancelled	0.00	0.00	-11.86
Income from the use of state and municipally owned property	307.91	57.69	391.78
Fines, sanctions and reparation	11.00	0.00	11.00
Execution of expenditures:			
Nationwide expenditures, including the functioning of the highest municipal official and local administrations	3 481.2	7 745.2	10 980.4
National defense	79.9	199.9	261.2
National economy	2 546.3	3 729.5	0.0
Housing and communal services, including landscaping	351.2	437.2	8 112.1
Education	0.0	19.5	25.0
Culture	2 928.1	4 957.0	10 254.6
Social policy	317.5	154.5	878.9
Physical training and sports	1 150.0	0.0	2 658.6

*MRS – Markovskoe rural settlement; **PRS – Podlesnoe rural settlement; ***PRS – Podlesnoe rural settlement.
Source: compiled according to data from the budget execution report of Vologodsky Municipal District provided by the financial department of the regional administration.

– increasing the management efficiency of the tax potential of its own tax base (personal property tax, land tax) as a whole of 127% to the level of 2017;

– additional taxes allowed to increase financing of the social sphere in the field of culture (by 130%) and physical training and sports (by 123%);

– the reduction of expenditures on the administrative personnel was 3%; however, taking into account the increase in municipal employees' salaries by 20% starting in 2020, we can note as a fact that the growth in general government expenditures has been avoided.

Moreover, an indisputable evidence of improved management efficiency and transparency of interaction with private business and the population is an increase in the number of implemented investment and infrastructure projects, including the use of mechanisms of initiative budgeting (*Tab. 6*).

The presented positive effects of the unification of settlements can serve as a basis to consider the issue of transforming the settlements that are part of Vologodsky Municipal District by means of their unification and giving the newly formed municipal entity the status of municipal district.

In the context of the purpose of the study, it seems important to consider the implementation of the practice of concluding agreements on the transfer of powers between the district and the settlements that are part of it[9].

At present, inter-municipal "economic" cooperation is not represented in the district, and the district and its settlements are not founders or participants in any inter-municipal organizations.

Table 6. Financing volumes of investment projects and projects under the People's Budget program implemented in 2017–2021 on the territory of Markovskoe and Podlesnoe rural settlements and Podlesnoe rural settlement, million rubles

Indicator	2017		2018	2019	2020	2021
	MRS*	PRS**	PRS***			
Investment projects	0	0	**281.334** (construction of a cowshed in the village of Kharachevo, opening of the enterprise OOO Vologodskaya Zelen in the village of Vasilievskoe)	**424.8** (start of the Akvaprodukt fish farm construction project in Gribkovo settlement, start of construction of the OAO Rodina dairy farm in Vasilyevskoe settlement)	**393.4** (continuation of 2019 projects)	**607.47** (construction of a medical and obstetrical station in Gribkovo, construction of a dairy farm in Vasilievskoe, continuation of the Akvaprodukt fish farm construction project)
Projects under the "People's Budget" program	0	0	**0.25** (playground)	**1.3** (2 sports grounds, lighting of a hockey court, purchase of sports equipment)	**1.9** (3 playgrounds, repair of the yard area)	**4.3** (4 playgrounds, street lighting, gym equipment)

*MRS – Markovskoe rural settlement; **PRS – Podlesnoe rural settlement; ***PRS – Podlesnoe rural settlement.
Source: compiled according to Rosstat data. Available at: https://rosstat.gov.ru/investment_nonfinancial

[9] "On the procedure for participation of Vologodsky Municipal District in intermunicipal cooperation": Decision of the Representative Assembly of Vologodsky Municipal District 243, dated June 17, 2014.

Analysis of the transferred volumes of financing for 2017–2022 (*Tab. 7*) clearly shows a trend toward centralization of the powers execution – an increase in the financing volume of powers transferred from settlements to the district level. In the structure of the transferred volumes, this trend is ensured by:

– reduction in financing of the authorities to supply water and perform road activities with regard to local roads (for reference: 99.7% of the total amount of financing of the delegated authorities is financing of road activities);

– increasing volume of financing of authorities transferred from the level of settlements to the level of district to implement measures of the program for formation of a modern urban environment (landscaping) in settlements, the authority to provide cultural and budgetary (accounting) services to settlements (for reference: 84.7% of total financing of the transferred authorities is financing of the authority to provide landscaping).

Since 2019, the authorities for road activities of three settlements have been transferred to the district level and are implemented in an inter-settlement format – the Municipal Budget Institution of Vologodsky Municipal District "Road maintenance and construction department" (hereinafter – MBI "DMCD"). In 2021, MBI "DMCD" serviced the five largest settlements in the district. Analysis of costs *(Tab. 8)* for implementation of the authority (taking into account increase in the cost of materials and wage growth) shows that in the period 2017–2021 the annual costs of independent exercise of the authority by rural settlements increased by 162.3%, the costs of road activities when the authority was transferred to the MBI "DMCD" – by 121% (while the area of the serviced territory remained the same)[10].

Table 7. Amount of financing of the transferred powers for 2017–2022 in Vologodsky Municipal District, thousand rubles

Settlement	2017		2018		2019		2020		2021		2022	
	↓*	↑**	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑
Kubenskoe	5 904.1	4 574	5 811.8	4 272	6 674.1	659	8 214.6	757	10 260.5	774	8 909.6	710
Leskovskoe	3 592.8	74	*0.0*	*0*	*0.0*	*0*	*0.0*	*0*	*0.0*	*0*	*0.0*	*0*
Mayskoe	4 845.8	224	5 319.3	176	6 098.6	918	358.5	503	179.6	910	14.1	930
Markovskoe	2 442.3	74	*0.0*	*0*	*0.0*	*0*	*0.0*	*0*	*0.0*	*0*	*0.0*	*0*
Novlenskoe	4 503.9	74	6 499.5	89	5 958.3	536	7 840.9	436	9 042.0	636	7 708.4	1 330
Podlesnoe	3 821.1	74	6 002.7	171	110.4	643	115.4	585	10.4	792	10.4	790
Prilukskoe	993.0	74	1 010.1	89	1 769.5	437	3 640.0	436	1 520.6	636	1 601.6	680
Semenkovskoe	7 783.3	74	3 041.4	172	693.6	647	331.0	508	3.1	762	3.1	855
Sosnovskoe	2 625.9	74	6 006.1	158	5 778.3	590	245.9	530	4.5	747	4.5	770
Spasskoe	5196.3	74	4 435.6	170	674.5	637	215.0	2 052	6.0	6 294	6.0	6 128
Staroselskoe	6 006.6	74	4 719.3	89	6 409.6	508	7 632.2	585	7 981.0	723	7 908.0	767
Fedotovskoe	865.6	224	1 299.2	359	1 801.5	740	1 601.5	609	1 451.5	902	1 500.5	928
Total:	**48 580.7**	**5 688**	**44 145.0**	**5744**	**35 968.4**	**6 315**	**30 195.0**	**7 002**	**30 459.3**	**13 176**	**27 666.2**	**13 888**

*↓ – the powers exercised by the authorities of the settlements; **↑ – the powers exercised by the district authorities.
Source: compiled according to the data from the budget execution report of Vologodsky Municipal District, provided by the financial department of the administration.

[10] On the approval of a comprehensive scheme of traffic organization of Vologodsky Municipal District: Resolution 234-01 of the Administration of Vologodsky Municipal District, dated February 8, 2021.

Table 8. Expenditures on road activities by executors of powers in 2017 and 2021, thousand rubles

The executor of the authority for road activities	Length of roads (km)	Amounts of financing	
		2017	2021
1. Independent exercise of powers in 2017–2021			
1.1. Kubenskoe rural settlement	255.43	5 640.30	9 480.00
1.2 Novelskoe rural settlement	215.85	4 245.40	7 950.00
1.3 Prilukskoe rural settlement	26.00	928.40	1 519.00
1.4 Staroselskoe rural settlement	208.77	5 596.00	7 636.20
1.5 Fedotovskoe rural settlement	5.74	865.10	1 451.00
Total 1	**711.78**	**17 275.20**	**28 036.20**
2. Independent execution of the power in 2017 and centralized service in 2021			
2.1 Mayskoe rural settlement	165.67	4 714.40	-
2.2 Podlesnoe rural settlement	170.31	6 113.50	-
2.3 Semenkovskoe rural settlement	93.54	3 436.20	-
2.4 Sosnovskoe Rural Settlement	183.64	6 064.30	-
2.5 Spasskoe Rural Settlement	156.50	5 049.10	-
Municipal budgetary institution "Road maintenance and construction department"	769.67	0.00	30 748.60
Total 2	1 539.34	25 377.50	30 748.60
TOTAL 1 and 2	**2 251.12**	**42 652.70**	**58 784.80**
Source: compiled according to the data from the budget execution report of Vologodsky Municipal District, provided by the financial department of the administration.			

Pursuant to Vologda Oblast Law 5122-OZ, dated May 6, 2022, a municipal reform and transition to a single-level system of local self-government with a transition period till January 1, 2023 is being implemented in Vologodsky Municipal District[11].

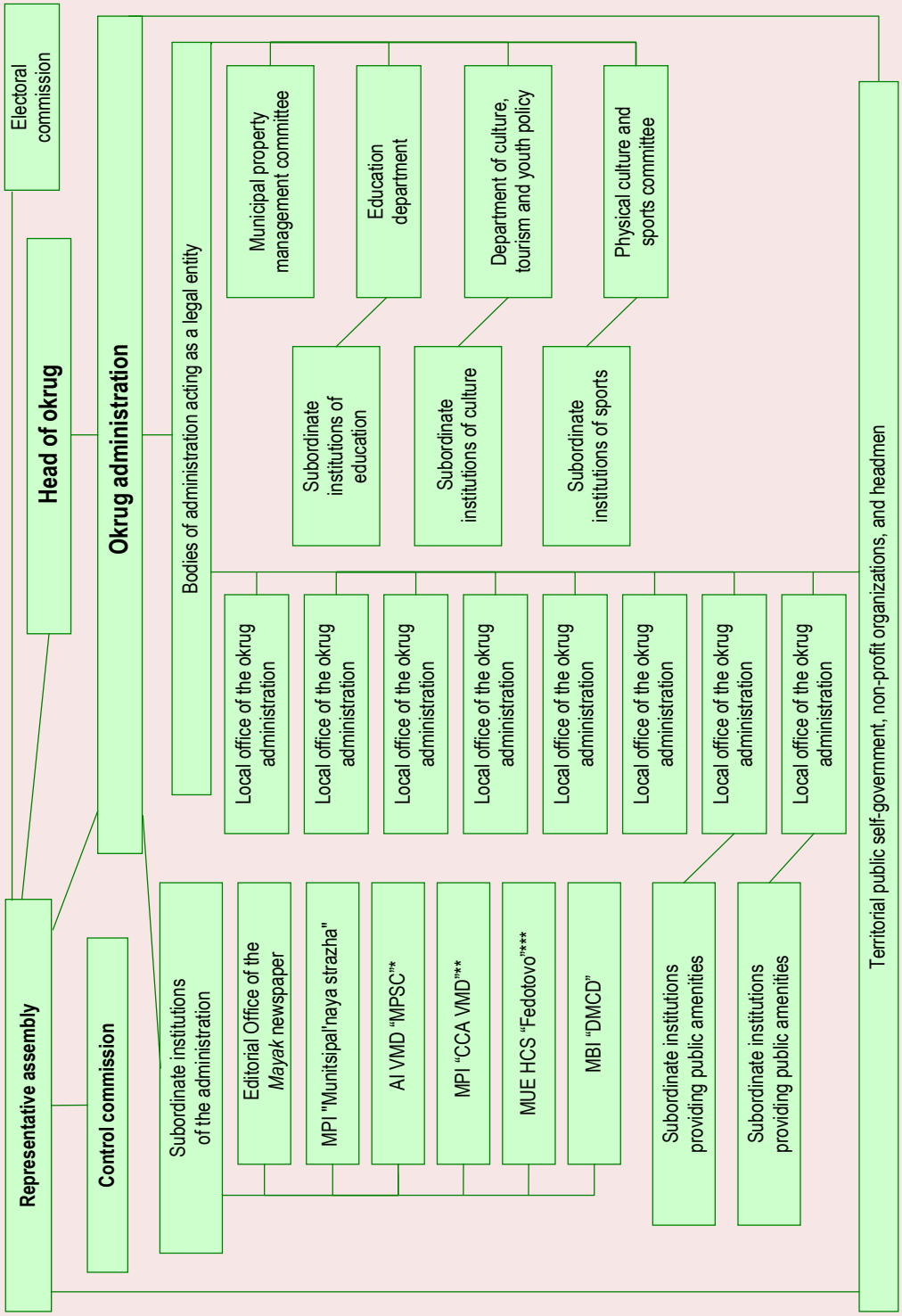
The model of local self-government organization on the territory of the district (*Figure)* is based on the preservation of local authorities in the format of territorial bodies of the regional administration with the rights of a legal entity, whose authority is planned to include landscaping, participation in the implementation of the Strategy of socio-economic development of Vologodsky Municipal District for the through up to 2030, work with the local community (territorial public self-government, the Institute of Elders, local public organizations).

Settlement institutions in the spheres of culture and sports will be placed under sectoral jurisdiction, and it is also planned to centralize accounting and road activities.

The need for such a structure is related to the existing system of settlement in the area, the lack of a district center, the presence of a large number of large settlements. Under these conditions, it is necessary to preserve the social, road, and engineering infrastructure and prevent the concentration of resources and the population in the urban district. The proposed model in synthesis with the support of the development of various forms of public self-government will help to level the main risks of the reform associated with the "separation" of power from the population.

[11] On the transformation of all settlements that are part of Vologodsky Municipal District of the Vologda Oblast by merging them and giving the newly formed municipal entity the status of a municipal district and on amendments to certain laws of the Oblast: Vologda Oblast Law 5122-OZ, dated May 6, 2022.

Model of the local self-government organization in Vologodsky Municipal District



Abbreviations:
* AI VMD "MPSC" – autonomous institution of Vologodsky Municipal District "Multifunctional Public Services Center";
** MPI "CCA VMD" – municipal public institution "Vologodsky Municipal District center of computational analysis";
*** MUE HCS "Fedotovo" – Municipal Unitary Enterprise of Housing and Communal Services "Fedotovo" of Vologodsky Municipal District.

Source: own compilation.

The transformation of local governments will improve organizational efficiency: eliminate duplication of local issues at different levels of government, ensure the unity of territorial planning documents and management of the property complex, and optimize inter-budget relations, document flow and the regulatory framework.

As a result of the reduction of expenditures on municipal elections and the administrative personnel in the amount of over 15.0 million rubles, the released funds may be allocated to the implementation of development projects. The most important result of the reform will be a more efficient management of resources, primarily land. The district development vector is aimed at infrastructural and demographic development, in this connection it is extremely important to eliminate administrative barriers for investors and citizens. The transition to a new model of local government organization will make it possible to implement a more effective territorial development policy with regard to the use of the economic potential of developed settlements.

Inter-municipal cooperation, for which the two-level organization of local government served as a brake, can become a key resource for the development of the territory of the district within the framework of the Vologda agglomeration that is being formed. To implement this strategy, it is necessary to sign an agreement on cooperation between the Vologda Urban Okrug and Vologodsky Municipal District, which should fix the directions, forms, mechanisms, and order of implementation of cooperation between these municipalities. The mechanism for implementing the agreement can be the elaboration of the Vologda agglomeration development concept, which provides the main directions and stages of development, taking into account the inclusion of Sokolsky and Gryazovetsky districts of the Vologda Oblast in the future.

The formation of a municipal district will make it possible to move to the next stage – the agglomeration development of the territory through the creation of a network of supporting settlements as local socio-economic centers of development. Changes in the documents of territorial planning will contribute to the improvement of the settlement structure, diversification of the economy, and enhancement of industrial development. This process is already underway, as evidenced by the agreement on the creation of the Leskovo Industrial Park on the territory of 63 hectares. The implementation of the project will help to create new jobs and reduce the dependence of the region on the largest enterprises of metallurgy and the chemical industry.

Conclusion

The study revealed the problems and prospects of transforming the management of municipalities as a set of solutions to optimize organizational management structures and reduce asymmetry in the socio-economic development of municipalities, primarily those that are the nearest periphery in the urban agglomeration.

We have developed and adapted theoretical and methodological provisions and practical recommendations to improve the management of the municipal entity located near a large city. The positive economic effect for the socio-economic development of the municipal entity located near a large city has been proved by such methods as consolidation of rural settlements, transfer of powers from the level of rural settlements to the level of municipal district, and transition to a single-level system of local government organization.

The scientific novelty of the conducted study consists in the development of a methodical approach to the substantiation of priorities and tools for transforming the system of municipal government in the context of the new reform of local self-government.

The results presented in the article can be replicated and used in the practice of managing the development of municipalities in Russia, as well as serve as the basis for further research on this topic, relating to the improvement of the management system at the local level.

References

Bukhval'd E.M., Valentik O.N., Kol'chugina A.V. et al. (2021). *K novym "Osnovam gosudarstvennoi politiki v sfere razvitiya mestnogo samoupravleniya"* [To The New "Fundamentals of State Policy in the Sphere of Local Self-Government Development"]. Moscow: Institut ekonomiki RAN.

Burkova O.M. (2013). Local government in France. *Munitsipal'naya vlast'=Municipal Authority,* 4, 12–18 (in Russian).

Casula M. (2020). A contextual explanation of regional governance in Europe: Insights from inter-municipal cooperation. *Public Management Review*, 22(12), 1819–1851.

Dadashpoor H., Ahani S. (2019). A conceptual typology of the spatial territories of the peripheral areas of metropolises. *Habitat International*. Available at: https://doi.org/10.1016/j.habitatint.2019.102015

Dement'ev V.S. (2019). Optimization of the administrative-territorial division of the Pskov Oblast: Assessment of the consequences. *Geograficheskii vestnik=Geographical Bulletin,* 1(48), 14–25 (in Russian).

Fang C. (2019). The basic law of the formation and expansion in urban agglomerations. *Journal of Geographical Sciences,* 29, 1699–1712.

Gainanov D.A., Tazhitdinov I.A., Ataeva A.G. (2017). Inter-municipal cooperation in the Russian Federation: theoretical and practical aspects. *Ekonomika i predprinimatel'stvo=Journal of Economy and Entrepreneurship,* 8-2(85), 295–300 (in Russian).

Khairullov D.S. (2019). Forms and methods of municipal management of the socio-economic development of the municipality territory. *Vestnik Kazanskogo tekhnologicheskogo universiteta=Bulletin of Kazan Technological University,* 23, 207–214 (in Russian).

Korechkov Yu.V., Velikorossov V.V., Rakauskiene O.G. (2021). Innovative organizational and economic approaches towards the consolidation of municipalities (on the example of the creation of the Cherepovets municipal district). *Sotsial'no-politicheskie issledovaniya=Social and Political Research,* 3(12), 56–71 (in Russian).

K ssler K., Kress A. (2021). European cities between self-government and subordination: Their role as policy-takers and policy-makers. In: *European Yearbook of Constitutional Law 2020*. Vol. 2. The Hague: T.M.C. Asser Press.

Kuznetsov S.V., Mezhevich N.M., Shamakhov V.A. (2019). Spatial aspect of the evolution of local self-government in the Russian Federation: Possibilities of taking into account foreign experience. *Upravlencheskoe konsul'tirovanie=Administrative Consulting,* 9, 8–14 (in Russian).

Li Li, Xiaojian Li, Jiawei Xu. (2020). Evolution of rural settlement in an inland nonmetropolitan region of China at a time of rapid urbanization: The case of Gongyi. *Journal of Rural Studies*, 79, 45–56.

Mishchenko V.V., Lyakisheva V.G., Yudina V.V. (2020). On the implementation of the experience of the regions of Russia in creating municipal districts in the administrative and territorial structure of the Altai Region. *Ekonomika. Professiya. Biznes=Economics. Profession. Business,* 4, 81–89 (in Russian).

Oreshnikov V.V., Ataeva A.G. (2018). Territorial transformation or inter-municipal cooperation: Comparative impact assessment based on economic and mathematical modeling. *Vestnik Tyumenskogo gosudarstvennogo universiteta. Sotsial'no-ekonomicheskie i pravovye issledovaniya=Tyumen State University Herald. Social, Economic, and Law Research,* 4(4), 271–296 (in Russian).

Pavlenkov I.M. (2018). A software approach to promoting the development of the municipality. *Innovatsii v menedzhmente=Innovations in Management,* 3(17), 44–53 (in Russian).

Shmidt A.V., Antonyuk V.S., Francini A. (2016). Urban agglomerations in the regional development: Theoretical, methodological aspects. *Economy of Region*, 12(3), 776–789.

Sirazhdinov R.Zh. (2021). The current implementation stage of the territorial development strategy of Russia. *Munitsipal'naya akademiya=Municipal Academy,* 2, 122–127 (in Russian).

Uskova T.V., Voroshilov N.V. (2015). *Regional'naya politika territorial'nogo razvitiya* [Regional Policy of Territorial Development]. Vologda: ISERT RAN.

Voroshilov N.V. (2017). Municipal-territorial system in Russia: Adaptation to diversity. *Voprosy territorial'nogo razvitiya=Territorial Development Issues,* 2(37), 1–15 (in Russian).

Voroshilov N.V. (2021b). Trends and prospects for changes in the municipal-territorial structure in Russia. *Problemy razvitiya territorii=Problems of Territory's Development,* 25(5), 105–124 (in Russian).

Voroshilov N.V. (2021a). Inter-municipal cooperation in Russia: Status, problems and prospects of development. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 14(6), 141–159 (in Russian).

Zidong Yu, Xintao Liu. (2021). Urban agglomerations economies and their relationships to built environment and socio-demographic characteristics in Hong Kong. *Habitat International*. Available at: https://doi.org/10.1016/j.habitatint.2021.102417

Information about the Author

Sergei G. Zhestyannikov – Head of Vologodsky Municipal District, Representative Assembly of Vologodsky Municipal District (24, Pushkinskaya Street, Vologda, 160000, Russian Federation; e-mail: jestyannikovsg@volraion.ru)

Received May 4, 2022.

DOI: 10.15838/esc.2022.4.82.7
UDC 339.56.05, LBC 65.59(2Rus)

Financial and Economic Aspects of Export-Import Activity of Russia's Non-Ferrous Metallurgy for 2013–2020 and Its Further Development Trends

Mariya A.
PECHENSKAYA-POLISHCHUK
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: 5164088@bk.ru
ORCID: 0000-0002-6067-2103; ResearcherID: I-6618-2016

Mikhail K.
MALYSHEV
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: mmk1995@mail.ru
ORCID: 0000-0003-1311-1888

Abstract. Non-ferrous metallurgy has a rather high significance for the Russian economy. The industry creates jobs and demand for highly qualified specialists providing a fairly high salary relative to other industries. Non-ferrous metallurgy is not inferior in importance to ferrous metallurgy. The industry's products act as indispensable components in the production of electronics and household appliances, batteries, lighting systems, machine tools and equipment, jewelry, various kinds of wires and cables, kitchen appliances, plumbing and other household items. Non-ferrous metallurgy assumes a higher price for final products relative to ferrous metallurgy and lower production volumes. The purpose of the research is to analyze the key financial and economic indicators of the development of foreign trade activities of non-ferrous metallurgy in Russia, as well as to predict further directions for the development

For citation: Pechenskaya-Polishchuk M.A., Malyshev M.K. (2022). Financial and economic aspects of export-import activity of Russia's non-ferrous metallurgy for 2013–2020 and its further development trends. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 102–117. DOI: 10.15838/esc.2022.4.82.7

of trade turnover in the prevailing new economic conditions. The object of the study is foreign trade relations arising between the Russian Federation and foreign countries regarding the export and import of non-ferrous metals. We use methods such as structural (weight) and dynamic analysis, comparison, systematization, and forecasting. The information base is statistical data on the export-import activities of Russia's non-ferrous metallurgy; Russian and foreign literature on the industry development; Rosstat statistics, as well as information from the annual reports of the largest Russian non-ferrous metallurgy corporations PJSC Rusal and PJSC Nornickel.

Key words: foreign trade, export-import operations, sales markets under sanctions, non-ferrous metallurgy, added value of turnover.

Acknowledgment

The article was prepared in accordance with the state task for VolRC RAS on research topic no. FMGZ-2022-0012 "Drivers and methods of sustainable socio-economic development of territorial systems in changing conditions of the external and internal environment".

Introduction to the problems

Due to the rapidly changing conditions of the external and internal environment, various kinds of new sanctions and restrictions in which the Russian economy is accustomed to function, sustainable socio-economic development can be achieved with certain difficulties.

Russia has a high integration level into the global economy largely playing the role of the first links in international value-added production chains. One way or another, any production begins with resources, materials, energy or, in another way, with raw materials. This is one of the important problems of the Russian economy – raw materials and low-cost relatively cheap exports in exchange for high-tech and science-based expensive imports. By selling large-tonnage raw materials abroad, Russia gives away added value which successfully enriches foreign companies and, accordingly, the economies of other countries.

In the article, we will consider the trends and features of the development of Russia's foreign trade in the non-ferrous metallurgy industry, since this industry is export-oriented and brings foreign currency resources to the country and companies. There are practically no studies related to the foreign trade activities of Russia's non-ferrous metallurgy in the Russian economic literature, and this fact increases the relevance of the article.

Thus, based on the purpose outlined in the abstract, the study will solve the following tasks: to analyze export-import operations, their structure and volume in monetary and physical terms; to consider changes in sales markets and purchases by country; to identify key exported and imported non-ferrous metals, as well as those entities of the Russian Federation that are regions-exporters and importers of non-ferrous metallurgy products to the greatest extent.

Theoretical overview and extent of elaboration of the topic

Currently, China has the largest positive balance, and the United States of America has a record negative balance. This is not surprising, as China, characterized by a large population and constantly growing production capacity, is a kind of "factory" for the whole world, while the United States, with an endless emission of unsecured dollars, is a global consumer of material goods that produces much less than it consumes[1]. Since the

[1] Trade balance. Available at: https://www.banki.ru/wikibank/torgovyiy_balans/

beginning of the 21st century, the US trade deficit has ranged from 350 to 730 billion dollars annually[2]. During the same time, the US national debt has grown from 5.6 trillion in 2000 to 30.3 trillion dollars in 2022[3]. Naturally, it is beneficial for the United States to maintain the monopoly of its currency in the global economy for as long as possible. After all, if all countries at once refused dollars and brought them to America on their ships to exchange, then it is already clear that all US property is not worth the money they have launched into the world economy since 1944 after the signing of the Bretton Woods system[4] (Baumann 2015; Bordo, 2014; Dibooglu, 1999). There is a considerable amount of research concerning the huge US government debt, but almost any type of tax policy will be unable to significantly affect its constant increase, and income tax growth for Americans will significantly reduce the purchasing power of their salaries and lead to a decrease in consumption which is also bad for the economy (Birkeland, Prescott, 2007; Chen, Imrohoroglu, 2017).

Turning directly to the research topic, we should note that there are few studies in the economic literature that address the issue of non-ferrous metallurgy turnover.

For instance, E.A. Rastyannikova (the Institute of Oriental Studies of RAS) has conducted an analysis of the world market of non-ferrous metallurgy resources. In the article, the author notes an increase in the volume of world production of non-ferrous metals, primarily due to the growing demand of rapidly developing Asian countries, namely China, India and South Korea. The work shows the dominant role of China in the consumption of all types of ores and concentrates of non-ferrous metals. China imports 78% of the world's production of aluminum ores, 61% of copper ores, 26% of zinc, 50% of lead ores, 86% of nickel, 33% of titanium and 90% of cobalt ores and concentrates. At the same time, China is not among the leaders exporting ores and concentrates of non-ferrous metals (Rastyannikova, 2020).

S.I. Ultan and N.Yu. Rogovskaya cover topics related to the problems of Russia's export potential growth, as well as the methodological foundations of its formation on the example of non-ferrous metallurgy. The authors have systematized indicators for assessing the country's export potential in the world market of non-ferrous metals. These indicators include analysis of the current state of export activity, financial situation, human resources, investment situation, production activity, price factor and business climate (Ultan, Rogovskaya, 2012; Ultan, Rogovskaya, 2013).

In the article, the researcher of the Russian Customs Academy, M.S Zhuravlev examines the conditions for increasing the competitiveness of non-ferrous metallurgy industries within the EAEU member states. The work presents the data on the analysis of the mineral resource base of non-ferrous metals of the member states, as well as the import and export of non-ferrous metallurgy products of the EAEU member states. The paper outlines the main trends of cooperative engagement in the field of non-ferrous metallurgy, among which are: the formation of a supranational mechanism for coordinating the industry, the development and normative regulation of promising forms of mutually beneficial industrial cooperation and subcontracting, various financial support tools, the development of industrial and innovative infrastructure (Zhuravlev, 2018).

The researchers of VolRC RAS also speak about the development features of the world and Russian metallurgy, both ferrous and non-ferrous. The monographs and articles have analyzed the

[2] The United States – Trade balance. Available at: https://ru.tradingeconomics.com/united-states/balance-of-trade

[3] The US national debt in 2022 exceeded $ 30 trillion. Available at: http://global-finances.ru/gosdolg-ssha/

[4] Why did General de Gaulle send a ship with dollars to the USA in 1965. Available at: https://finance.rambler.ru/markets/40113848-zachem-v-1965-godu-general-de-goll-otpravil-v-ssha-korabl-s-dollarami/

financial and production results of large Russian metallurgical corporations, and reviewed the distribution and dividend policy (Ilyin, Povarova, 2019; Pechenskaya-Polishchuk, Malyshev, 2021a; Pechenskaya-Polishchuk, Malyshev, 2021b; Ilyin et al., 2021).

Head of the Laboratory of the Institute of Economic Forecasting RAS, I.A. Budanov has reviewed the plots concerning the management of the development of the global metallurgical market and the industry development based on social guidelines. The research examines the imbalances of the metal market and the conflicts of market participants. The work shows the interrelation of the processes of metallurgy development and the features of the management mechanism of industrial flows of products, resources, capital. The paper highlights the specifics, advantages and disadvantages of the mechanisms that determine the processes of sectoral development (Budanov, 2020).

In addition, I.A. Budanov has proposed an approach to forecasting sectoral development under the influence of processes in the social sphere, considered the contradictions associated with the influence of metallurgical production on the formation of socio-economic conditions in the country. The author has shown that social factors played a significant role in making decisions on the establishment of metallurgy enterprises and the management of the metal market. The main social functions performed by metallurgy are highlighted (Budanov, 2021).

It is worth saying that the previous issues of the journal *Economic and Social Changes: Facts, Trends, Forecast* present some articles, devoted to export-import topics. The authors of Vologda Research Center studied the possibilities of economic growth of Russia's entities on the basis of the development of non-commodity exports. The researchers studied the evolution of views on the role of export activity in economic growth. In addition, a scientifically based methodological approach was developed to assess the real share of non-commodity exports of Russia's regions in the total volume of products shipped abroad, as well as the author's approach to the classification of non-commodity exports (Gulin et al., 2018). Scientists of Volgograd State University considered the development of methodological approaches to assessing the effectiveness of import substitution in Russia. Their methodology was tested on the example of food products. The authors identified the processes that inhibit import substitution in the food industry, and its positive trends, confirming the effectiveness of import substitution. The optimal structure of commodity resources is calculated ensuring the full achievement of the effectiveness of import substitution of food products (Litvinova et al., 2019).

The study by Russian authors, published in English, presents an analysis concerning the trade of the countries of the Eurasian Economic Union with external partners. The authors have noted that the growth and stability of exports of the EAEU countries are due to the stable situation in demand for petroleum products and non-ferrous metals. In a sense, this export structure was inherited from the Soviet Union, when the bulk of exports were energy resources and metals (Ayuchatova et al., 2013).

The English-language literature presents a research, devoted to the study of import dependence of non-ferrous metallurgy in India. The author notes that the most significant metals for the development of engineering industries are copper, aluminum, lead, zinc and tin. They are the basis for the proper functioning of the manufacturing industry, as well as for other sectors such as agriculture, trade, transport and defense. In this regard, import substitution and cheaper production of these non-ferrous metals will have the most favorable effect on the Indian economy (Leela, 1979).

A team of Chinese scientists notes that forecasting prices for non-ferrous metals is crucial for investors, politicians and researchers. Accurate and reliable forecasting of prices for non-ferrous metals is a difficult but necessary task due to strong fluctuations and irregular cycles in metal prices. To investigate the effectiveness of forecasting the proposed model, we have conducted extensive experiments using daily future prices for zinc, copper and aluminum on the London Metal Exchange (LME), we have included six modern methods. The results of the experiment demonstrate that the proposed model has excellent performance for forecasting prices for non-ferrous metals (Liu et al., 2020).

Research results

In the foreign economic activity of any country, the turnover refers to the total volume of exports and imports, shown in monetary or physical (weight) terms[5].

The data of the Federal Customs Service, affecting the export and import of Russia's metallurgical products, state a reduction in total trade turnover from 62.5 to 50.7 billion dollars (or 19%) in the period from 2013 to 2020. The largest share in the export-import trade in metals falls on ferrous metallurgy products, which amounts to 255.7 billion dollars (60%) for the period. The turnover of key non-ferrous metals is: copper is 45.5 billion dollars (10.7%); nickel – 24.2 billion dollars (5.7%); aluminum – 60 billion dollars (14.1%). The total volume of foreign trade in copper increased from 5.8 to 7.2 billion dollars (+24%); trade in nickel and aluminum decreased by 23 and 26%, respectively (*Tab. 1*).

Speaking about the production structure, among the key non-ferrous metals, here we can also note the aluminum predominance. In just eight years, the aluminum turnover in Russia's foreign economic activity has reached almost 30 million tons, which

Table 1. Financial structure of the turnover of Russia's metallurgical industry by the main groups of metals and products from them

Period	Copper		Nickel		Aluminum		Ferrous metals and products*		Other non-ferrous metals and products**		Total, billion dollars
	billion dollars	%	billion dollars	%	billion dollars	%	billion dollars	%	billion dollars	%	
2013	5.8	9.3	4.1	6.5	8.8	14.1	37.7	60.3	6.1	9.8	62.5
2014	5.9	9.9	4.2	7.0	7.8	13.1	36.4	60.9	5.5	9.2	59.8
2015	4.9	11.0	2.7	6.1	7.9	17.6	25.0	56.1	4.1	9.1	44.6
2016	3.7	9.4	2.1	5.3	6.5	16.4	23.4	58.9	4.0	10.0	39.7
2017	5.5	10.5	2.2	4.1	7.7	14.5	32.5	61.5	4.9	9.3	52.8
2018	6.2	10.1	2.7	4.5	7.8	12.8	38.6	63.3	5.7	9.4	61.0
2019	6.3	11.3	3.1	5.6	7.0	12.7	33.4	60.3	5.6	10.1	55.4
2020	7.2	14.2	3.1	6.2	6.5	12.9	28.7	56.6	5.2	10.2	50.7
Total:	**45.5**	**10.7**	**24.2**	**5.7**	**60.0**	**14.1**	**255.7**	**60.0**	**41.1**	**9.6**	**426.5**
2020 to 2013, times	1.24	1.53	0.77	0.95	0.74	0.92	0.76	0.94	0.84	1.03	0.81

* This category includes: rolled products, bars, corners, cast iron, ferroalloys, waste and scrap of non-ferrous metals, iron, unalloyed steel in ingots and primary forms, etc.
** Tin, zinc, lead, precious metals (tungsten, titanium, cadmium, bismuth, molybdenum, tantalum, antimony, zirconium, etc.), cermets, spoons, forks, knives, locks, accessories, fasteners, etc.
Source: own calculation according to the data of the Federal Customs Service.

[5] The foreign trade turnover. The system of turnover indicators. Available at: https://spravochnick.ru/vneshneekonomicheskaya_deyatelnost/vneshnyaya_torgovlya/

Table 2. Production structure of the turnover of Russia's metallurgical industry by the main groups of metals and products from them

Period	Copper		Nickel		Aluminum		Ferrous metals and productions*		Other non-ferrous metals and products**		Total, thousand tons
	thousand tons	%	thousand tons	%	thousand tons	%	thousand tons	%	thousand tons	%	
2013	781	1.4	265	0.5	4,067	7.3	49,446	89.2	874	1.6	55,433
2014	806	1.4	246	0.4	3,556	6.3	50,563	90.2	886	1.6	56,057
2015	879	1.6	234	0.4	3,953	7.0	50,572	89.7	758	1.3	56,396
2016	761	1.3	232	0.4	3,939	6.9	51,094	89.9	777	1.4	56,803
2017	941	1.6	248	0.4	3,859	6.4	54,494	90.2	879	1.5	60,421
2018	989	1.5	250	0.4	3,719	5.7	59,068	91.0	918	1.4	64,944
2019	1,067	1.8	274	0.5	3,463	5.8	53,675	90.4	899	1.5	59,378
2020	1,230	2.2	264	0.5	3,438	6.1	50,210	89.6	900	1.6	56,042
Total:	**7,454**	**1.6**	**2,013**	**0.4**	**29,994**	**6.4**	**419,122**	**90.0**	**6,891**	**1.5**	**465,474**
2020 to 2013, times	1.57	1.56	1.00	0.99	0.85	0.84	1.02	1.00	1.03	1.02	1.01

* This category includes: rolled products, bars, corners, cast iron, ferroalloys, waste and scrap of non-ferrous metals, iron, unalloyed steel in ingots and primary forms, etc.
** Tin, zinc, lead, precious metals (tungsten, titanium, cadmium, bismuth, molybdenum, tantalum, antimony, zirconium, etc.), cermets, spoons, forks, knives, locks, accessories, fasteners, etc.
Source: own calculation according to the data of the Federal Customs Service.

is 6.4% of the total turnover of the country's metallurgical industry. The total copper turnover amounted to 7.5 million tons (1.6%), and nickel – 2 million tons (0.4%). Over the period 2013–2020, the total volume of export-import copper sales in Russia increased by 57% due to increased supplies to Kuwait and China, as well as increased purchases from Germany and Finland. The nickel turnover in 2013 and 2020 had approximately equal values (about 265 thousand tons), but it was the smallest in 2016 (232 thousand tons), which was caused to a greater extent by a 2.4-fold decrease in exports to the Netherlands compared to 2013. The reduction in aluminum turnover by 15% is due to a decrease in exports to the USA and the Netherlands by 77 and 60%, respectively, as well as a 10-fold reduction in imports from Kazakhstan.

We should say that ferrous metallurgy products, having a natural large tonnage and lower cost in comparison with non-ferrous metals, consistently occupy about 90% of the total turnover (*Tab. 2*).

Let us consider in more detail the dynamics of export-import sales of key non-ferrous metals. The data of the Federal Customs Service allow concluding that the total copper export, both in financial and production indicators, significantly exceeds its import. In 2013–2020, copper exports amounted to 38.6 billion dollars and 6.4 million tons, which is 5.6 and 6.2 times more than its imports. The biggest difference was typical for 2015, when copper exports accounted for 90% of its turnover. This situation is associated with a reduction in copper imports and its appreciation, which occurred as a result of sanctions restrictions and the fall of the ruble in 2014 due to the Ukrainian conflict and the accession of Crimea to the territory of the Russian Federation. Despite the fact that the average cost of an exported ton of copper for 8 years was 10% lower than the imported ton, or 604 dollars, the reduction in the average cost of a ton of imported copper was 37%, and the export cost was 18% over the study period. In addition, positive changes include the excess of the average cost of a ton of copper exports over its imports, starting in 2017, which indicates the effectiveness of import substitution (*Tab. 3*).

Table 3. Dynamics of copper export-import sales in Russia for 2013–2020

Period	Copper export			Copper import			Ratio of export and import		
	million dollars	thousand tons	thousand dollars per ton	million dollars	thousand tons	thousand dollars per ton	million dollars	thousand tons	thousand dollars per ton
2013	4,980	686	7,259	825	94.4	8,739	6.0	7.3	0.8
2014	4,930	742	6,644	975	64.4	15,140	5.1	11.5	0.4
2015	4,470	824	5,425	447	54.8	8,157	10.0	15.0	0.7
2016	3,270	692	4,725	461	68.5	6,730	7.1	10.1	0.7
2017	4,720	780	6,051	813	161	5,050	5.8	4.8	1.2
2018	5,380	857	6,278	788	132	5,970	6.8	6.5	1.1
2019	5,220	886	5,892	1,030	181	5,691	5.1	4.9	1.0
2020	5,650	945	5,979	1,560	285	5,474	3.6	3.3	1.1
Total:	**38,620**	**6,412**	**6,023**	**6,899**	**1041.1**	**6,627**	**5.6**	**6.2**	**0.9**
2020 to 2013, times	1.13	1.38	0.82	1.89	3.02	0.63	0.60	0.46	1.31
Source: own calculation according to the data of the Federal Customs Service.									

Under the conditions of sanctions and the high dollar exchange rate, nickel sales increased by 9%, while the value of transactions decreased by 20%, at the same time, nickel imports decreased by more than 10 times. The negative aspect is the increase in the cost of an imported ton of nickel by 3.5 times, while export nickel fell by 27% per ton. Nevertheless, the revenue from the sale of Russian nickel for 8 years amounted to 23.2 billion dollars, which is 22.6 times more than the cost of imported nickel. The total weight of exported nickel was slightly less than 1.97 million tons, which is 46.1 times more than the weight of imported nickel into the country. The key in the structure of exports of nickel products in Russia is unprocessed nickel, which has a lower added value compared to imported nickel matte and agglomerates. Thus, Russian non-ferrous metallurgy corporations producing nickel have a high potential in import substitution, as well as in the nickel export of higher added value (*Tab. 4*).

The volume of exported aluminum from Russia in 2013–2020 amounted to 27.5 million tons, which is 11 times more than the total weight of imported aluminum. Total export sales amounted to about 50 billion dollars and exceeded the value of imports by 5 times. The volume of aluminum sales for export decreased by 22%, the mass of exports –

Table 4. Dynamics of nickel export-import sales in Russia for 2013–2020

Period	Nickel export			Nickel import			Ration of export and import		
	million dollars	thousand tons	thousand dollars per ton	million dollars	thousand tons	thousand dollars per ton	million dollars	thousand tons	thousand dollars per ton
2013	3,780	241	15,685	289	24.5	11,796	13.1	9.8	1.3
2014	4,020	241	16,680	164	5.3	30,943	24.5	45.5	0.5
2015	2,660	232	11,466	70.8	1.5	47,200	37.6	154.7	0.2
2016	2,020	230	8,783	88.3	1.7	51,941	22.9	135.3	0.2
2017	2,080	245	8,490	104	3.4	30,588	20.0	72.1	0.3
2018	2,610	248	10,524	109	2.1	51,905	23.9	118.1	0.2
2019	2,970	272	10,919	105	2	52,500	28.3	136.0	0.2
2020	3,020	262	11,527	93.6	2.3	40,696	32.3	113.9	0.3
Total:	**23,160**	**1,971**	**11,750**	**1023.7**	**42.8**	**23,918**	**22.6**	**46.1**	**0.5**
2020 to 2013, times	0.80	1.09	0.73	0.32	0.09	3.45	2.47	11.58	0.21
Source: own calculation according to the data of the Federal Customs Service.									

Table 5. Dynamics of aluminum export-import sales in Russia for 2013–2020

Period	Aluminum export			Aluminum import			Ration of export and import, times		
	million dollars	thousand tons	thousand dollars per ton	million dollars	thousand tons	thousand dollars per ton	million dollars	thousand tons	thousand dollars per ton
2013	7,010	3,612	1,941	1,780	455	3,912	3.9	7.9	0.5
2014	6,260	3,189	1,963	1,560	367	4,251	4.0	8.7	0.5
2015	6,830	3,697	1,847	1,020	257	3,969	6.7	14.4	0.5
2016	5,570	3,678	1,514	939	261	3,598	5.9	14.1	0.4
2017	6,420	3,554	1,806	1,260	305	4,131	5.1	11.7	0.4
2018	6,540	3,430	1,907	1,240	289	4,291	5.3	11.9	0.4
2019	5,840	3,169	1,843	1,200	294	4,082	4.9	10.8	0.5
2020	5,460	3,174	1,720	1,070	264	4,053	5.1	12.0	0.4
Total:	**49,930**	**27,503**	**1,815**	**10,069**	**2,492**	**4,041**	**5.0**	**11.0**	**0.4**
2020 to 2013, times	0.78	0.88	0.89	0.60	0.58	1.04	1.30	1.51	0.86

Source: own calculation according to the data of the Federal Customs Service.

by 12%, while imports decreased even more. The cost of buying imported aluminum decreased by 710 million dollars (-40%), and its volume by 191 thousand tons (-42%). Unfortunately, the cost of exported tons of aluminum decreased by 11%, and imported – increased by 4%, as a result of which imported aluminum on average turned out to be 2.2 times more expensive than exported (*Tab. 5*).

Among the main consumers of key non-ferrous metals produced by the Russian Federation, we can highlight the Netherlands. 60.1% of all exported nickel, 36.8% of copper and 14.4% of aluminum are sent to this country. Russia's revenues for 2013–2020 from the copper sale to the Netherlands amounted to 14.2 billion dollars, from the sale of nickel and aluminum – 13.9 and 7.2 billion dollars accordingly.

Despite the EU sanctions, copper supplies to the Netherlands have increased by 2% over 8 years, unlike Germany, where Russian copper exports has decreased by 3 times. In addition to Germany, Belgium has practically abandoned the import of Russian copper.

One way or another, Russia has reoriented its copper sales markets to Asian countries, primarily China and Kuwait. In the 2020 pandemic year, copper sales to these countries were several thousand times more than in 2013. Mostly refined and unprocessed copper went to China, and copper wire went to Kuwait. Especially noteworthy is the increase in the growth rate of copper wire rod in Kuwait. In August 2019, the export of copper wire rod from the Russian Federation amounted to 16.6 thousand tons which is 94.9% more than in July of the same year[6].

In addition to copper, Belgium has also abandoned Russian nickel. Exports to the Netherlands have been reduced three times, and to Ukraine by more than five times. However, active nickel supplies to Switzerland and Finland began. For example, Rusal's partner and shareholder, Glencore trader, is located in Switzerland, and thanks to the European registration, the company can redirect metal to consumers who are afraid of direct purchases in Russia[7]. It is important to note that about 95% of Russia's income from the sale of nickel falls on three countries – the Netherlands, Switzerland and Finland. The key nickel products exported to the Netherlands and Switzerland are raw nickel, to Finland – nickel matte and nickel oxide agglomerates.

[6] Russia continues increasing exports of copper wire rod to Kuwait. Available at: https://ekoprommet.com/news/rossiya-prodolzhaet-narashhivat-eksport-mednoj-katanki-v-kuvejt/

[7] Glencore is back for aluminum. Available at: https://www.kommersant.ru/doc/4314117

All the main consumers of Russian aluminum have reduced their purchases by a total of 48% including: the USA – by 77%, the Netherlands – by 60%, Turkey – by 5%, Japan – by 20% and South Korea – by 15%. During the study period, aluminum sales to these countries amounted to 30.2 billion dollars, the main product is raw aluminum (*Tab. 6*).

The main copper exporting regions were Krasnoyarsk Krai, the Sverdlovsk and Chelyabinsk oblasts which accounted for 78.5% of all-Russian copper exports. Copper exports from Krasnoyarsk Krai increased by 71% in monetary terms, from the Sverdlovsk and Chelyabinsk oblasts – by 9 and 28%, respectively. Saint Petersburg, which exports 1/10 of all copper in the country, reduced exports by 58% – from 566 to 235 million dollars.

The key nickel exporters in Russia abroad are the Murmansk Oblast and Krasnoyarsk Krai, their share is 94.5% of the All-Russian nickel exports. Production and transport facilities are located in the Murmansk Oblast (Murmansk Transport Branch) assets of PJSC Nornickel. Due to more profitable logistics corridors, nickel exports from Krasnoyarsk Kai stopped and were reoriented to the Kola Peninsula.

Responsible for the aluminum export from Russia were the Irkutsk Oblast, Krasnoyarsk Krai, as well as the Republic of Khakassia, which accounted for 72.3% of all aluminum exports. At the same time, the Irkutsk Oblast and Khakassia, where the assets of PJSC Rusal are located, reduced exports by an average of 39%, and exports from Krasnoyarsk Krai practically did not change (*Tab. 7*).

Table 6. Export of key non-ferrous metals from Russia to the world countries for 2013–2020, million dollars

Copper						
No.	Country	Country's share in export, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	The Netherlands	36.8	1,680	1,710	14,200	1.02
2	Germany	13.6	1,150	390	5,250	0.34
3	China	12.1	36.5	1,800	4,670	49.32
4	Kuwait	8.0	0.2	650	3,100	3250.00
5	Belgium	5.3	534	0.046	2,100	0.0001
	Total:	75.8	3,401	4,550	29,320	1.34
Nickel						
No.	Country	Country's share in export, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	The Netherlands	60.1	3,580	1,200	13,900	0.34
2	Switzerland	19.1	0	828	4,430	x
3	Finland	15.4	0.94	895	3,570	952.13
4	Ukraine	1.3	86.7	15.6	311	0.18
5	Belgium	0.7	19.2	0	172	x
	Total:	96.6	3,687	2,939	22,383	0.80
Aluminum						
No.	Country	Country's share in export, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	USA	17.2	1,630	376	8,600	0.23
2	The Netherlands	14.4	1,600	637	7,170	0.40
3	Turkey	11.9	847	802	5,960	0.95
4	Japan	11.1	696	559	5,530	0.80
5	South Korea	5.9	394	333	2,950	0.85
	Total:	60.5	5,167	2,707	30,210	0.52

Source: own calculation according to the data of the Federal Customs Service.

Table 7. Export of key non-ferrous metals from Russian regions for 2013–2020, million dollars

Copper						
No.	Region	Share of region in exports by country, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Krasnoyarsk Krai	35.8	1,310	2,240	13,800	1.71
2	Sverdlovsk Oblast	28.3	1,710	1,870	10,900	1.09
3	Chelyabinsk Oblast	14.4	646	830	5,560	1.28
4	Saint Petersburg	10.3	566	235	3,960	0.42
5	Murmansk Oblast	5.2	251	250	2,010	1.00
	Total:	94.0	4,483	5,425	36,230	1.21
Nickel						
No.	Region	Share of region in exports by country, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Murmansk Oblast	53,6	720	2960	12400	4,11
2	Krasnoyarsk Krai	40,9	2810	0,012	9470	0,00
3	Chelyabinsk Oblast	2,5	133	3,1	570	0,02
4	Moscow Oblast	1,2	51	24	278	0,47
5	Moscow	0,8	42,8	14	194	0,33
	Total:	99,0	3757	3001	22912	0,8
Aluminum						
No.	Region	Share of region in exports by country, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Irkutsk Oblast	30.3	2,310	1,390	15,100	0.60
2	Krasnoyarsk Krai	24.8	1,580	1,620	12,400	1.03
3	Khakassia	17.2	1,170	727	8,600	0.62
4	Moscow	4.2	98.9	399	2,100	4.03
5	Sverdlovsk Oblast	4.1	303	235	2,030	0.78
	Total:	80.6	5,462	4,371	40,230	0.8

Source: own calculation according to the data of the Federal Customs Service.

Total copper imports to Russia from the five leading countries increased by 56%, while copper from Finland became the most purchased (+97%). Copper imports from Germany increased by 80%, from China and Italy – by 37 and 55%, respectively. Copper supplies from Kazakhstan decreased by 29% over the period. It is worth saying that more than 90 copper deposits have been explored on the territory of Kazakhstan. The current copper reserves are about 41 million tons, which is about 5% of the world's reserves. The republic ranks 4th in the world in terms of copper reserves after Chile, Indonesia and the USA[8]. On the five main copper importers to Russia for 2013–2020 it accounts for about 52% of all imports, while there is no clear dependence on one country. A certain differentiation of copper imports has a positive impact on the stability of supplies, as well as on the possibility of changing suppliers under any restrictions. The main imported copper products to Russia are: copper waste and scrap, copper matte, copper fittings and couplings for pipes, copper tubes.

Nickel supplies to Russia from key supplier countries decreased by 73% or 118 million dollars during the study period. The main imported nickel products include: raw nickel; nickel fabrics, gratings and grids; nickel matte and agglomerates, as well as rods, profiles and wire. Procurement of nickel products from the United States and France to Russia decreased by 30 and 11%, respectively, of the delivery from Finland has almost stopped; nickel imports from Germany increased by 77% for the period.

[8] Kazakhmys Empire: In whose hands are the copper resources of Kazakhstan. Available at: https://knews.kg/2021/03/14/imperiya-kazahmysa-v-chih-rukah-mednye-resursy-kazahstana/

Table 8. Import of key non-ferrous metals from foreign countries to Russia for 2013–2020, million dollars

Copper						
No.	Country	Country's share in export, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Finland	12.5	189	373	862	1.97
2	Germany	11.9	110	198	820	1.80
3	Kazakhstan	10.9	105	74.6	752	0.71
4	China	10.3	74.7	102	713	1.37
5	Italy	6.3	55.5	86.3	437	1.55
	Total:	51.9	534	834	3,584	1.56
Nickel						
No.	Country	Country's share in export, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	USA	14.8	17.5	12.2	152	0.70
2	Norway	10.1	33.5	2.5	103	0.07
3	Finland	9.4	88.5	0.3	96.5	0.003
4	France	9.3	12.3	11	94.8	0.89
5	Germany	9.1	10.2	18.1	92.6	1.77
	Total:	52.7	162	44	538.9	0.27
Aluminum						
No.	Country	Country's share in export, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	China	29.4	467	376	2,950	0.81
2	Kazakhstan	11.1	286	29.4	1,110	0.10
3	Germany	10.4	169	111	1,050	0.66
4	Belarus	8.7	136	112	875	0.82
5	Italy	7.9	186	66	794	0.35
	Total:	67.5	1,244	694	6,779	0.56

Source: own calculation according to the data of the Federal Customs Service.

Aluminum imports, which is the most popular of the non-ferrous metals purchased, decreased by 44% or 550 million dollars. In the study period, Russia purchased about 30% of all aluminum from China. Imports from Kazakhstan decreased tenfold, from Italy – by 65%, from China, Germany and Belarus – by 19, 34 and 18%, respectively. The key imported products of China are plumbing equipment, kitchen cutlery and household products. Mainly raw aluminum and aluminum scrap were purchased from Kazakhstan. Imports from Germany were represented by hardware products and aluminum foil. Aluminum metal structures, bars and profiles were supplied to the Russian market from Belarus, plumbing equipment and fasteners from Italy (*Tab. 8*).

The main importers of copper products were the Sverdlovsk Oblast and Moscow, where their share amounted to 46.5% of total imports. The volume of imports to the Sverdlovsk Oblast increased 10 times mainly due to copper scrap and cementation copper. Copper purchases to the Kaliningrad and Moscow oblasts decreased by 8 and 49%, respectively. Total imports in monetary terms in five key regions increased from 420 million to 1 billion dollars in 9 years. The main imported products include copper fittings, tubes and pipes, copper matte and scrap, as well as powders and copper flakes.

The key consumers of imported nickel were Moscow, the Murmansk, Yaroslavl and Moscow oblasts. The share of these regions accounted for about 69% of all nickel imported into the country.

In total, the import of this metal during the study period decreased by 4 times. The Murmansk Oblast completely refused to import. The main imported products are nickel matte, agglomerates and untreated nickel. Slightly more than half of the imported aluminum accounts for Moscow and the region, as well as Saint Petersburg. Total aluminum imports decreased by 38% to Moscow, by 76 and 50% to the Moscow Oblast and Saint Petersburg, respectively. The main imported products are plumbing equipment, aluminum foil, aluminum profiles and rods (*Tab. 9*).

There are quite a considerable number of both short-term and long-term prerequisites for the reorientation of markets for non-ferrous metallurgy products from European countries to the Russian market, markets of North Africa, Southeast Asia and other markets in which Russia is connected by economic unions. Let us look at some of them in more detail:

1. Sanctions pressure from the EU states.

Since the beginning of the special military operation of the Russian Federation in Ukraine, European countries have imposed sanctions against Russian metallurgy. Despite the fact that ferrous metallurgy suffered to a greater extent, non-ferrous metallurgy was also under attack. For example, PJSC Nornickel has difficulties in transporting palladium. The company transported it on passenger planes, and as a result of the termination of flights between Russia and the rest of the world, Nornickel has to look for alternative routes. We should note that the delivery of non-ferrous metals by sea is also problematic. The UK has banned ships having any relation to Russia from entering its ports.

Table 9. Import of key non-ferrous metals to Russian regions in 2013–2020, million dollars

Copper						
No.	Region	Share of region in import by country, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Sverdlovsk Oblast	29.2	67.1	682	2,020	10.16
2	Moscow	17.3	153	174	1,200	1.14
3	Kaliningrad Oblast	8.5	35.8	32.8	585	0.92
4	Saint Petersburg	7.7	67.6	69	533	1.02
5	Moscow Oblast	6.8	97.4	49.5	467	0.51
	Total:	69.5	420.9	1007.3	4,805	2.39
Nickel						
No.	Region	Share of region in import by country, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Moscow	26.4	41.6	38.1	270	0.92
2	Murmansk Oblast	15.3	149	0	156	x
3	Yaroslavl Oblast	14.7	18.6	11.8	150	0.63
4	Moscow Oblast	12.3	33.2	9.86	125	0.30
5	Belgorod Oblast	3.9	9.42	1.48	40.3	0.16
	Total:	72.6	251.82	61.24	741.3	0.24
Aluminum						
No.	Region	Share of region in import by country, %	2013	2020	Total for 2013–2020	2020 to 2013, times
1	Moscow	31.5	529	329	3170	0.62
2	Moscow Oblast	12.2	190	144	1230	0.76
3	Saint Petersburg	8.4	174	86.5	844	0.50
4	Leningrad Oblast	4.5	82.6	50.1	449	0.61
5	Samara Oblast	4.2	170	19.2	427	0.11
	Total:	60.8	1145.6	628.8	6120	0.55

Source: own calculation according to the data of the Federal Customs Service.

This principle may be followed by other EU countries, which in the future will lead to the inability to transport non-ferrous metals on ships[9].

2. Guarantee of receipt of funds.

According to the President of the Russian Federation, carrying out foreign trade "in compromised currencies", namely in dollars and euros, is becoming more risky every time[10]. There is a high probability that the correspondent accounts of Russian exporters in European banks may be blocked and Russian companies simply will not receive money.

In early April 2022, the State Duma Speaker Vyacheslav Volodin proposed expanding the list of goods exported for rubles; however, according to NLMK's main shareholder Vladimir Lisin, there are certain concerns that the transition to payments for metals in rubles will simply "throw" Russia out of international markets. The owner of the metallurgical plant claims that logistical problems have already complicated the delivery of products to the consumer. Russian metallurgy has been building relationships with thousands of customers in 70 countries for decades, has been fighting for export markets, where no one is particularly waiting for it, and now it is difficult to imagine what can convince buyers to switch to settlements in rubles and bear currency risks[11].

3. No carbon footprint tax.

The active struggle of the EU countries for a favorable environmental situation in the world as a whole has positive motives. In July 2021, the European Commission presented an environmental plan according to which carbon emissions into the atmosphere should be reduced by 55% to 1990 levels by 2030. One of the main requirements is the introduction of a carbon tax in the form of quotas for 1 ton of CO_2 emissions from 2026. This tax will have to be paid to those countries that import products of non-ecological enterprises into the European Union.

Naturally, the Russian industry needs to strive for carbon neutrality, since reducing CO_2 emissions is a global trend, and not just a whim of the European Union. In addition, countries such as China, Japan and South Korea[12] declare carbon neutrality as a national goal. In the long term for 2026–2030, regulation may lead to the fact that Russian producers with a high carbon footprint will move to other Asian markets, since Asian countries will be unable to quickly follow the example of the European Union, due to the difficulties of implementing regulatory plans[13].

According to Sergey Roginko, Head of the Center for Ecology and Development of the Institute of Europe of the Russian Academy of Sciences, the EU is pursuing an extremely aggressive policy toward traditional sources of fuel and energy, which poses a serious threat to Russian exports, primarily of energy carriers. The annual additional costs of Russian exporters from the introduction of the carbon tax are estimated at 2.1 billion euro for the gas industry, for ferrous metallurgy – 967 million euros, for non-ferrous metallurgy – 348 million euros (Roginko, 2021).

[9] Unpleasant, but not fatal: how metallurgists will be forced to work for the good of the motherland. Available at: https://fedpress.ru/article/2951636?utm_source=yandex.ru&utm_medium=organic&utm_campaign=yandex.ru&utm_referrer=yandex.ru

[10] "Abandon compromised currencies": Putin instructed to transfer gas payments for unfriendly countries to rubles. Available at: https://russian.rt.com/russia/video/980093-putin-gaz-valyuta-rubli

[11] The head of NLMK said that the transition to payments in rubles will throw Russia out of the markets. Available at: https://tass.ru/ekonomika/14280771

[12] Carbon starvation: How can Russia adapt to the EU import tax. Available at: https://trends.rbc.ru/trends/green/cmrm/617a91d89a79477d74afe1e0

[13] The EU is introducing a carbon tax. What is its essence and how it works: Ecology News +, July 15, 2021. Available at: https://finance.rambler.ru/economics/46827367/?utm_content=finance_media&utm_medium=read_more&utm_source=copylink

4. Preservation of VAT in the federal budget and the absence of customs duties.

The reorientation of non-ferrous metals sales markets from the European market to meet Russia's needs or to the markets of the EAEU countries will have a positive impact on both federal budget revenues and the cost of the companies themselves. For example, VAT refund on export operations from the federal budget in favor of non-ferrous metallurgy enterprises of Krasnoyarsk Krai (PJSC Nornickel) and the Irkutsk Oblast (PJSC Rusal) for 2006–2021 amounted to about 260 billion rubles. Thus, the change of sales markets would allow saving up to 16 billion rubles in the federal budget annually only in respect of two non-ferrous metallurgy companies. In addition, the absence of export duties for products exported from Russia to the EAEU countries contributes to reducing the companies' costs to pay such duties, which lead to an increase in the production cost. Such expenses reduce taxable profits and, accordingly, income tax receipts to the regions' budgets where companies are based.

5. Covering domestic demand for non-ferrous metals due to active import substitution.

The approved action plan for import substitution in Russia's non-ferrous metallurgy industry contains detailed targets regarding the share of Russian products in various trade names by 2024.

According to the document, it is planned to increase the share of Russian production of ores and concentrates of non-ferrous metals: from 0 to 12.9% – for zirconium concentrates, from 0 to 8.2% – for ilmenite and from 0 to 43.1% – for rutile concentrates. With regard to non-ferrous metals, compounds and alloys, it is planned to replace: 50% individual oxides of rare earth metals; lithium hydroxide anhydride – from 0 to 80%, increase the share of tin of own production from 71 to 95%. Among the significant changes in the import substitution of high-grade products, there are plans to cover the import of copper electrode wire and cathode powder by 80%; to fully manufacture aluminum aerosol cans based on DWI technology; to replace the import of aluminum bicycle frames by 50%[14].

Thus, active import substitution in the non-ferrous metallurgy industry will allow the Russian industry to be independent on foreign production chains, as well as to control the entire production cycle without risks.

Conclusions

At the end of the study, we will list the key conclusions obtained in the abstract:

1. Turnover in monetary terms.

The financial structure of the metallurgical industry turnover in Russia is characterized by the dominance of ferrous metals, which averaged 60% over the period under study, or 32 billion dollars. The key non-ferrous metals in Russia's trade with foreign countries were: aluminum (14.1%), copper (10.7%) and nickel (5.7%), while since 2013 the turnover of nickel and aluminum has decreased by 23 and 26%, respectively, and copper has increased by 24% by 2020.

2. Turnover in kind.

The higher level of production volumes of ferrous metallurgy, in comparison with non-ferrous, once again confirms the analysis of trade turnover in weight values. In the period under study, the turnover volume of Russia's metallurgical industry amounted to 465.5 million tons, of which 419.1 million tons or 90% is the turnover of ferrous metals. The aluminum turnover amounted to 30 million tons, copper and nickel – 7.5 and 2 million tons, respectively. The share of these metals in the weight structure was 6.4% for aluminum, 1.6 and 0.4% for copper and nickel, respectively.

[14] Order of the Ministry of Industry and Trade of the Russian Federation no. 651, dated March 31, 2015 "On approval of the action plan for import substitution in the non-ferrous metallurgy industry of the Russian Federation". Available at: http://www.consultant.ru/document/cons_doc_LAW_297024/1080c5207773f8f88cca332f1240c1f7e85871c9/

3. The cost of export and import tons of non-ferrous metals.

During the period under study, the cost of an export ton of copper decreased by 18%, and an import ton by 37%. The cost of 1 ton of imported nickel decreased by 27%, while the price of imported nickel increased 3.5 times due to an increase in the supply of expensive nickel products (tubes, fittings, couplings, elbows, nickel flanges). The price of 1 ton of aluminum decreased by 11%, and imports increased by 4%.

4. Key changes in the sales and supply markets of non-ferrous metallurgy products.

The reorientation from European markets to East Asian markets has been characteristic of the key products of non-ferrous metallurgy in Russia since 2013. Copper exports to Germany decreased by 66%, almost stopped to Belgium, while intensive supplies to Kuwait and China began. The Netherlands, as one of the key countries purchasing non-ferrous metals from Russia, reduced nickel exports by 66% and exports by 60%.

5. Benefits of changing markets.

The key advantages of the gradual redirection from European consumers to the Russian market and the EAEU countries' market: absence of sanctions pressure from the EU states; guarantee of receiving funds; absence of a carbon footprint tax; VAT preservation in the federal budget and the absence of customs duties; import substitution development and reduced dependence on foreign supplies.

6. Contribution to science, novelty and directions of further research.

The article contributes to the development of applied science and clearly demonstrates the structural transformation of supply and sales markets under sanctions restrictions, or rather its gradual reorientation to East Asian markets on the example of Russia's non-ferrous metallurgy industry.

Systematization of the benefits of the reorientation of sales markets, as the novelty of this study, will allow authorities and businesses to design the necessary measures for further growth in the face of sanctions pressure and restrictions.

It is worth noting that further research will focus on exploring the opportunities associated with the growth of the added value of the products of Russian non-ferrous metallurgy corporations, as well as on the possibilities of import substitution of the most necessary and expensive goods of the industry.

References

Ayuchatova P.A., Volodina N.V., Dronova O.V. (2013). Trade development trends between Eurasian Economic Community member countries and their foreign partners. *Models, Systems, Networks in Economics, Technology, Nature and Society*, 3(7), 9–12.

Baumann B. (2015). The battle of Bretton Woods: John Maynard Keynes, Harry Dexter White, and the making of a new world order. *Eastern Economic Journal*, 41, 289–291. Available at: https://doi.org/10.1057/eej.2014.18

Birkeland K., Prescott E.C. (2006). On the needed quantity of government debt. *Working Paper* 648, Federal Reserve Bank of Minneapolis.

Bordo M.D. (2014). Tales from the Bretton Woods. *Open Economic Review, Springer*, 25(5), 981–991. Available at: https://doi.org/10.1007/s11079-014-9326-8

Budanov I.A. (2020). Managing the development of metallurgy and global metal market. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 6, 104–118. DOI 10.47711/0868-6351-183-104-118 (in Russian).

Budanov I.A. (2021). Working out social guidelines for the industry development of metallurgy. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 14(5), 85–99. DOI: 10.15838/ esc.2021.5.77.5 (in Russian).

Chen K., İmrohoroğlu A. (2017). Debt in the U.S. economy. In: *Economic Research Forum, Working Paper 1401.* Koc University-TUSIAD Economic Research Forum. Available at: https://doi.org/10.1007/s00199-015-0908-5

Dibooglu S. (1999). Inflation under the Bretton Woods system: The spillover effects of U.S. expansionary policies. *Atlantic Economic Journal*, 27, 74–85. Available at: https://doi.org/10.1007/BF02299179

Gulin K.A., Yakushev N.O., Mazilov E.A. (2018). Promoting economic growth in regions of the Russian Federation by boosting the development of non-resource-based exports. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends,* 11(3), 57–70. DOI: 10.15838/esc.2018.3.57.4 (in Russian).

Ilyin V.A., Pechenskaya-Polishchuk M.A., Malyshev M.K. (2021). *Gosudarstvo i krupnye korporatsii chernoi metallurgii: tendentsii i osobennosti 20-letnego vzaimodeistviya: monografiya* [The State and Large Ferrous Metallurgy Corporations: Trends and Features of 20-Year Interaction: Monograph]. Vologda: VolRC RAS.

Ilyin V.A., Povarova A.I. *Krupneishie metallurgicheskie korporatsii i ikh rol' v formirovanii byudzhetnykh dokhodov: monografiya* [The Largest Metallurgical Corporations and Their Role in the Formation of Budget Revenues: Monograph]. Vologda: VolRC RAS.

Leela P. (1979). Import dependence of the non-ferrous metals industry in India. *Foreign Trade Review*, 13(4), 324–340.

Litvinova A.V., Talalaeva N.S., Parfenova M.V. (2019). Development of methodological approaches to assessing the effectiveness of import substitution in Russia. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends,* 12(4), 67–85. DOI: 10.15838/esc.2019.4.64.5 (in Russian).

Liu Y., Yang Ch., Huang K., Gui W. (2019). Non-ferrous metals price forecasting based on variational mode decomposition and LSTM network. *Knowledge-Based Systems*, 188, 105006.

Pechenskaya-Polishchuk M.A., Malyshev M.K. (2021). Metallurgical corporations and the state: Trends in financial interaction of the last decade. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends,* 14(3), 150–166. DOI: 10.15838/esc.2021.3.75.9 (in Russian).

Pechenskaya-Polishchuk M.A., Malyshev M.K. (2021). Key factors affecting the corporate tax levied from Russian ferrous metallurgy corporations to regional budgets. *Regionologiya=Russian Journal of Regional Studies*, 1(114), 10–36 (in Russian).

Rastyannikova E.V. (2020). Global non-ferrous metallurgy resources market. *Vostochnaya analitika=Eastern Analytics*, 3, 109–130 (in Russian).

Roginko S.A. (2021). Cross-border carbon taxes: For the Russian fuel and energy complex. *Energeticheskaya politika=Energy Policy*, 10(164), 38–47 (in Russian).

Ultan S.I. (2013). Trends and problems of Russia's export potential growth in the world market of non-ferrous metals. In: *Ekonomika Rossii v usloviyakh globalizatsii* [The Russian Economy in the Context of Globalization]. Omsk: Izd-vo OmGU (in Russian).

Ultan S.I., Rogovskaya N.Y. (2012). Industry export potential: Formation and research methodological foundations. *Vestnik Omskogo universiteta. Seriya: Ekonomika=Herald of Omsk University. Series "Economics"*, 1, 26–32 (in Russian).

Zhuravlev M.S. (2018). On the issue of improving the competitiveness of non-ferrous metallurgy of the EAEU member states. *Evraziiskii yuridicheskii zhurnal=Eurasian Law Journal*, 10(125), 481–483 (in Russian).

Information about the Authors

Mariya A. Pechenskaya-Polishchuk – Candidate of Sciences (Economics), Leading Researcher, head of department, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: 5164088@bk.ru)

Mikhail K. Malyshev – Junior Researcher, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: mmk1995@mail.ru)

Received April 26, 2022.

ENVIRONMENTAL ECONOMICS

DOI: 10.15838/esc.2022.4.82.8
UDC 330.322:574(470+571), LBC 65.263

Environmental Investment as a Key Factor in the Formation and Evolvement of an Investment Model for the Growth of the Russian Economy

Lyudmila A.
KORMISHKINA
Ogarev Mordovia State University
Saransk, Russian Federation
e-mail: kormishkinala@mail.ru
ORCID: 0000-0001-6009-3374; ResearcherID: AAK-2150-2021

Evgenii D.
KORMISHKIN
Ogarev Mordovia State University
Saransk, Russian Federation
e-mail: kormishkined@mail.ru
ORCID: 0000-0002-7524-4072; ResearcherID: AAK-1819-2021

Irina A.
IVANOVA
Ogarev Mordovia State University
Saransk, Russian Federation
e-mail: ivia16@mail.ru
ORCID: 0000-0003-1113-0858; ResearcherID: CAG-4446-2022

Dmitrii A.
KOLOSKOV
Ogarev Mordovia State University
Saransk, Russian Federation
e-mail: Kda1977@mail.ru
ORCID: 0000-0003-2916-4626

For citation: Kormishkina L.A., Kormishkin E.D., Ivanova I.A., Koloskov D.A. (2022). Environmental investment as a key factor in the formation and evolvement of an investment model for the growth of the Russian economy. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 118–135. DOI: 10.15838/esc.2022.4.82.8

Abstract. The complex debate in the recent economic literature about environmental quality in economic growth, looking for a return to long-term sustainable growth in total factor productivity, recognizing the environmental aspect of development as an imperative confirm the relevance of the research topic. The aim of the study is to provide a theoretical substantiation of environmental investment as a key factor in ensuring long-term and sustainable economic growth, an "active start" to the radical transformation of the Russian economy in accordance with the requirements of the global Environmental, Social, and Corporate Governance agenda; another aim is to conduct an experimental testing of the identified scientific idea. Environmental investment is characterized as a type of responsible and transformative investment capable of generating incremental total factor productivity growth by stimulating specific green innovations. The methodology of the study included methods of identification, analysis and verification of an econometric model in the form of a system of dynamic regressions by Sh. Almon with distributed lags. Experimentally (by constructing different regressions and testing Student's hypotheses for them, determining estimates of t-statistics) as applied to the Russian economy, we evaluated long-term and short-term responses of economic growth indicators to the volume of environmental investment (specifically, its priority focus, such as waste-free and recycling resources). The econometric model has established a long-term positive effect of environmental investments. The effect consists in protecting the integrity of natural capital and improving the condition of ecosystems, which is fundamental to maintaining the potential for economic the long-term growth. Short- and medium-term effects include creating new high-tech jobs in low CO_2 sectors and restoring total factor productivity growth through green technological innovation. The main barriers to environmental investment in Russia have been identified, and the minimum necessary economic instruments to stimulate it have been developed.

Key words: economic growth, environmental challenges, global ESG agenda, environmental investment, disinvestment, total factor productivity, long-term sustainable economic growth, green economy.

Acknowledgment

This research was funded by RFBR, project number 20-010-00060 "Developing the theory and methodology of environmental investments in the context of the 'outcome' concept of the growth dilemma".

Introduction

The scale of the shocks taking place in the world economy (including the Russian economy) gives reason to consider the current economic situation as a kind of global cataclysm comparable to the Great Economic Depression or even exceeding it. Quarantine measures applied by most countries (Russia as well) have reduced the mortality rate from COVID-19, but have caused a serious economic recession, which is exacerbated by unprecedented external sanctions pressure on Russia. Against this background, all the problems and limitations of development that have accumulated in the global and national economy in recent decades are becoming more acute. Undoubtedly, the priority among the current trends and patterns belongs to environmental issues.

We should note that the current crisis, for example, for Russia can be reflected by such indicators as a drop in demand for Russian exports, the vast majority (about 90%) of which are raw materials and semi-raw materials, a drop in production due to inflation and a decrease in investment activity. It is obvious that in such conditions, not only the Russian Federation,

but also all the economies of the world – poor, rich and medium-developed – are programmed for economic growth in the coming decades. Michael Spence, winner of the Nobel Prize in Economics said that "growth is, first of all, a means to an end; it increases people's chances of productive and creative employment, ... creates freedom and the possibility of self-realization" (Spence, 2012). RAS Corresponding Member R. Grinberg emphasizes that "the prospects of the socio-economic image of the country must be assessed primarily from the viewpoint of the prospects for economic growth" (Grinberg, 2008). In other words, "while the economy is growing, positive feedback mechanisms tend to push the system in the direction of further development" (Jackson, 2009).

In this context, we note that in accordance with the UN Sustainable Development Goals (SDGs) for 2016–2030, which are a kind of call to action emanating from all nations, annual GDP growth per capita (the most adequate indicator of welfare growth today) is set for the least developed economies at 7% (the goal is 8%); The Supreme Eurasian Economic Council has identified this indicator at 5–5.5% as a benchmark for the EAEU member states. According to the estimates of RAS Academician Sergei Yu. Glazyev, even under the conditions of external sanctions pressure on Russia, a "good and workable" model of the national economy, not rent-based, but oriented toward constant technological modernization as its integrated and organic component, can ensure annual economic growth of at least 10%[1] (Glazyev, 2018).

In addition, we should recognize that the growth of the economy in its neoliberal model (in Russia, it is oriented toward raw materials exports), in which its main locomotive is gross consumption, leads to an increased burden on the environment under the influence of an increase in the ecological footprint and ecological debt of mankind, deterioration of environmental quality (saturation of the atmosphere with greenhouse gases and climate change, increasing the volume of harmful waste and emissions, reducing biodiversity and freshwater reserves, soil degradation, depletion of mineral resources, etc.). The identified environmental challenges, which have become global in the 21st century, dictate the need to change the economic paradigm: "The transition to an economic structure that functions not in spite of the productive forces of nature, but with them" (Fücks, 2019), provided by radical transformations of the economy in accordance with the global ESG agenda (Bobylev, 2020; Bobylev et al., 2021; Matveeva, Gridnev, 2022). Moreover, even in the context of the pandemic, the ecological and economic priorities in the development of countries were emphasized at the World Economic Forum held in Davos in 2020. In the forum's reports, only environmental risks were identified among the traditional priority risks (extreme weather events, failure of climate action, loss of biodiversity, depletion of natural resources, sharp increase in the amount of waste, natural disasters of anthropogenic origin)[2].

In the current conditions, when unprecedented external sanctions pressure actually coincided with the exhaustion of the possibilities of the country's raw-materials-exporting (consumer, rental) model of economic growth, we cannot but recognize that the Russian economy is at a bifurcation point of its development and in a state of unstable equilibrium, when there are several main development options that continue this unstable trend. National projects adopted in accordance with Presidential Decree 204, dated May 7, 2018, including the "Ecology" project, the plan of priority actions for the RF Government for post-crisis economic recovery under external sanctions pressure (approved March 15, 2022), are certainly necessary and capable of supporting the development of the domestic economy. At the same time, from a strategic

[1] Glazyev S.Yu. (2022). Growth of 10% per year is not a fantasy. *Argumenty i fakty*. 2013. No. 13. P. 3.

[2] The Global Risks Report 2020. Available at: https://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf

perspective, they are not enough to ensure GDP growth rates that are ahead of global dynamics. The current situation forces us to look for ways to form a new model of economic growth that can develop and provide a high level of income at the expense of knowledge-intensive, high-tech and resource-efficient production, rather than natural and opportunistic rents.

In other words, we are talking about a model of economic growth that should be adequate to the principles of the global Environmental, Social, and Corporate Governance agenda (ESG agenda) and have the following important features:

- priority in development is given to knowledge-intensive and high-tech manufacturing and infrastructural types of economic activity with minimal impact on the environment;
- environmentally efficient interactions of production and consumption, reducing environmental pollution;
- waste-free and resource recycling;
- ensuring environmental safety as a special social good, etc. (Fishman et al., 2019; Bobylev et al., 2021).

Against this background, in the framework of tough discussions unfolding in recent economic literature concerning the quality of the environment in the context of economic growth, the increasing number of scientists and experts point out that the possibility of achieving sustainable growth of total factor productivity (TFP) ensuring economic growth (Gordon, 2016) is associated with the change in the balance between consumption and investment in the economy in favor of the latter[3] (Spence 2012; Sukharev, 2019, Sukharev, Voronchikhina, 2020; Banerjee, Duflo, 2019), specifically, with "significant advance environmental investments" (Jackson, 2009; Jackson, 2017; Yakovlev et al., 2017; Kormishkina et al., 2018; Spiridonova, 2020; Kormishkina et al., 2021), "which create the right environment for such a flourishing innovation and such a transformation of the environment that we cannot even imagine"[4].

To date, environmental investments remain poorly studied and do not have a generally accepted and clear definition, they are often identified with "green" financing and "green" investments. At the same time, relying on the interpretation of the "green" economy by UNEP and on numerous competing goals of environmental investment (reduction of carbon dioxide emissions, productive use of natural capital, replacement of non-renewable natural resources with renewable ones, adaptation and improvement of ecosystems, creation of public assets, etc.), this definition, in our opinion, should be considered as all types of property and intellectual investments in economic activity that not only provide investors with profit, but also help them to achieve a certain environmental benefit in the form of reducing the negative impact on the natural environment and positive social change in the context of sustainable development of economic systems. World practice shows a great return on such investments: their effect (averted damage) in the economy as a whole is 10–15 times higher than their initial volumes (Rakov, 2017; Spiridonova, 2020).

We should add that Russia can benefit from focusing on environmental investment due to the following reasons: 1) ignoring their increasing role due to the preservation of the raw-materials-exporting (rent) model of economic growth promotes anti-sustainable environmental trends (high level of environmental intensity and intensity of pollution; depletion of natural capital; structural shifts in the economy that increase the share of nature-exploiting and polluting economic activities; type of export based mainly on commodities, etc.) that, in turn, jeopardize the achieved economic and social results;

[3] Spence M. High growth sectors in the post recovery decade. Available at: https://www.project-syndicate.org/commentary/post-covid-high-growth-sectors-by-michael-spence-2021-04

[4] Robert Gordon and Joel Mokyr, "Boom vs. Doom: Debating the Future of the US Economy," debate, Chicago Council of Global Affairs, October 31, 2016.

2) the economic costs of environmental degradation, which in Russia, according to World Bank experts, range from 1 to 6% of GDP (which significantly exceeds the value of this indicator for developed countries[5]), reduce the competitiveness of Russia's economy at the global level; 3) such investments can increase employment in economic sectors with a low carbon footprint, reduce poverty and improve the standard of living and quality of life, and people's life potential (Banerjee, Duflo, 2019); 4) in the current situation, there is no need to choose between economic growth and environmental protection; these two goals can be achieved simultaneously. The economic recession caused by the COVID-19 pandemic and external sanctions pressure provides Russia with a unique opportunity to invest in radical transformations of the 21st century economy in order to make a decisive turn from the sidelines to the highway of socio-economic progress ensured by the formation of a "green" economy.

Such an approach to the nature of environmental investment forms a clear understanding: it is wrong to harm the environment with economic activity, as well as it is wrong to receive income from an environmental disaster. This means that environmental investments simultaneously generate de-investments, that is, withdrawal of funds or their transfer to other, environmentally friendly industries; refusal to invest in securities and funds if they carry out unethical or morally questionable activities from the perspective of the global ESG agenda (Animitsa et al., 2020). Finally, in the context of ensuring long-term sustainable growth of TFP, environmental investments are in line with the criteria and driving forces of the Fourth Industrial Revolution (Schwab, 2017) and the non-industrial paradigm of modern development in Russia, the fundamental program of which was justified even before the pandemic economic recession by Russian economic scientists (Gubanov, 2012; Daskovsky, Kiselyov, 2016).

What we have stated above makes it necessary to form the subject area of environmental investment, requires a detailed study of its components. The purpose of our research is to theoretically substantiate and experimentally test the original scientific hypothesis that in the current difficult situation formed in Russia under the influence of the COVID-19 pandemic and unprecedented external sanctions pressure, first of all, environmental investment can create a "window of opportunity" to launch an effective investment model of economic growth adequate to the requirements of the global ESG agenda; moreover, environmental investment can become an "active start"[6] of radical transformations in the 21st century economy.

Research methodology

The methodological basis of our study, besides traditional generally accepted methods of cognition (scientific abstraction, analysis and synthesis, a combination of logical and historical methods, analogy method, etc.), includes econometric methods and models, the specifics of which take into account, among other things, the time lag of endogenous and exogenous indicators. At the same time, designing an estimated econometric model reflecting the long-term and short-term responses of economic growth indicators from the volume of environmental investments is based on a conceptual approach consisting in a combination in one form or another of the components of aggregate demand from the well-known Keynesian macroeconomic model[7] with a modified Cobb–Douglas production function, which in addition to traditional components includes the factor such as the formation and processing of production and consumption waste (Pittel et al., 2010). The significance of this factor has increased much due to the COVID-19 pandemic and its limitations.

[5] Damianova A. et al. (2018). Russia Green Finance: Unlocking Opportunities for Green Investments. Available at: https://documents1.worldbank.org/curated/en/699051540925687477/pdf/131516-RUSSIAN-PN-P168296-P164837-PUBLIC-Green-finance-Note.pdf

[6] Keynes J.M. (1936). *The General Theory of Employment, Interest and Money*. Available at: http://www.library.fa.ru/files/generaltheory.pdf

[7] Ibedem.

The indicator "investments in fixed assets aimed at environmental protection and rational use of natural resources"[8] is considered as an indicator of environmental investments (according to Rosstat Order 682 "On approval of methodological guidelines for calculating the index of the physical volume of environmental expenditures", dated November 21, 2018); for other countries of the world, such an indicator is bubble environmental expenditures and business "green" investments[9].

Verification of the hypothesis indicated above was carried out using the constructed system of two dynamic regressions by S. Almon (The Almon Polynomial Distributed Lag) (Griffiths et al., 1993) with distributed lags (1):

$$\begin{cases} Y_{1t} = \delta + \beta_0 X_{1t} + \beta_1 X_{1t-1} + \beta_2 X_{1t-2} + \cdots + \beta_l X_{1t-l} + \varepsilon_t \\ \ln(Y_{2t}) = \alpha + \gamma_0 \ln(Y_{1t}) + \gamma_1 \ln(Y_{1t-1}) + \gamma_2 \ln(Y_{1t-2}) + \\ \quad + \cdots + \gamma_l \ln(Y_{1t-l}) + u_t, \end{cases} \quad (1)$$

where Y_{2t} is the volume of GDP per capita in the Russian Federation (an indicator of economic growth);

Y_{1t} is the volume of investments in fixed assets aimed at environmental protection and rational use of natural resources in the RF;

X_t is the volume of formation and processing of production and consumption waste.

Methods of correlation, linear and nonlinear regression, factor and variance analysis, generalized least squares method, as well as the method of instrumental variables were used to identify, analyze and verify the econometric model (1) and its economic interpretation.

In the model (1), β_0, γ_0 are short-term multipliers, $\sum_{k=1}^{l} \beta_k$; $\sum_{k=1}^{l} \gamma_k$ are long-term multipliers characterizing the change in performance indicators under the influence of a single change in exogenous variables in each of the future time periods under consideration.

According to Almon's approach, if the effective indicator depends on the current and lag values of exogenous indicators, then the weights β_j, γ_i in (1) comply with the polynomial distribution (2) (Ivanova et al., 2021):

$$\begin{aligned} \beta_j &= c_0 + c_1 j + c_2 j^2 + \ldots + c_k j^k, \\ \gamma_i &= d_0 + d_1 i + d_2 i^2 + \ldots + d_k i^k. \end{aligned} \quad (2)$$

The procedure for applying Almon's method for estimating the parameters of models with a distributed lag (1) assumes:

– determining the maximum lag value l;

– determining the degree of the polynomial k describing the lag structure (2);

– introducing instrumental variables (3):

$$\begin{aligned} Z_0 &= X_t + X_{t-1} + X_{t-2} + X_{t-3} + \cdots + X_{t-l}; \\ Z_1 &= X_{t-1} + 2X_{t-2} + 3X_{t-3} + \cdots + l \cdot X_{t-l}; \\ Z_2 &= X_{t-1} + 4X_{t-2} + 9X_{t-3} + \cdots + l^2 \cdot X_{t-l}; \\ &\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ Z_k &= X_{t-1} + +2^k X_{t-2} + 3^k X_{t-3} + \cdots l^k \cdot X_{t-l}; \end{aligned} \quad (3)$$

– determining the parameters of the multiple linear regression (4):

$$\begin{aligned} Y_t = \delta + c_0 \cdot Z_0 + c_1 \cdot Z_1 + c_2 \cdot Z_2 + \cdots + \\ + c_k \cdot Z_k + \varepsilon_t; \end{aligned} \quad (4)$$

– using the ratios (5), the parameters of the initial models with a distributed lag (1) are calculated:

$$\begin{aligned} \beta_0 &= c_0 \\ \beta_1 &= c_0 + c_1 + c_2 + c_3 + \cdots + c_k \\ \beta_2 &= c_0 + 2c_1 + 4c_2 + 8c_3 + \cdots 2^k c_k \\ &\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ \beta_l &= c_0 + l \cdot c_1 + l^2 \cdot c_2 + l^3 \cdot c_3 + \cdots + l^k \cdot c_k. \end{aligned} \quad (5)$$

The indicated methodological approach, in our opinion, makes it possible to assess the contribution of different types of environmental investments within their structure not only to aggregate demand, but also to the production potential of the economy, ensuring long-term sustainable economic growth.

Research results

Trends and problems of environmental investment, responsible in its essence and transformative in its functional role

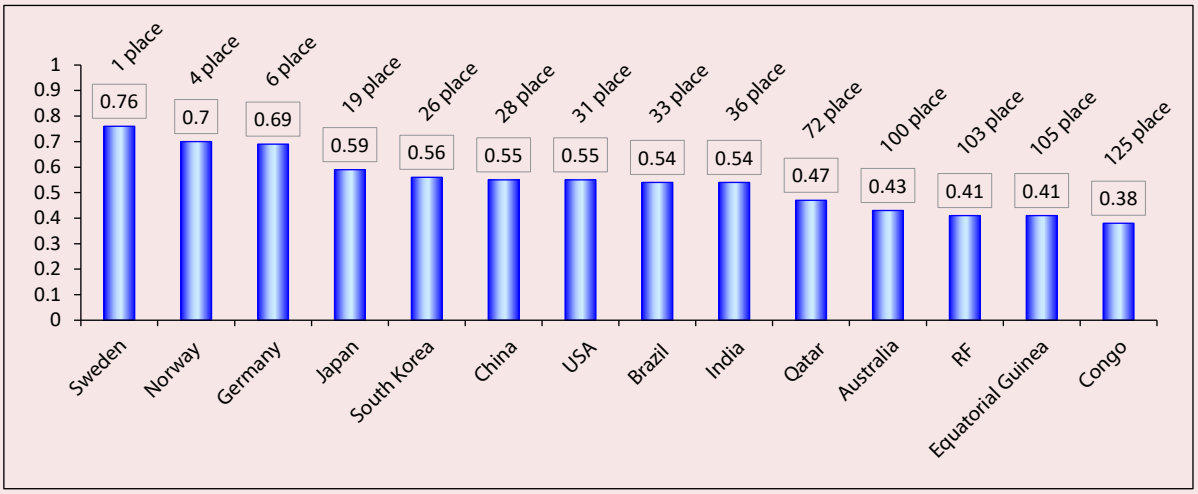
According to the results of the study, even the largest economies of the world show unstable progress in the field of policy and investment that ensure the formation of a new model of the national

[8] URL: https://rosstat.gov.ru/

[9] OECD Stat. Available at: https://stats.oecd.org/

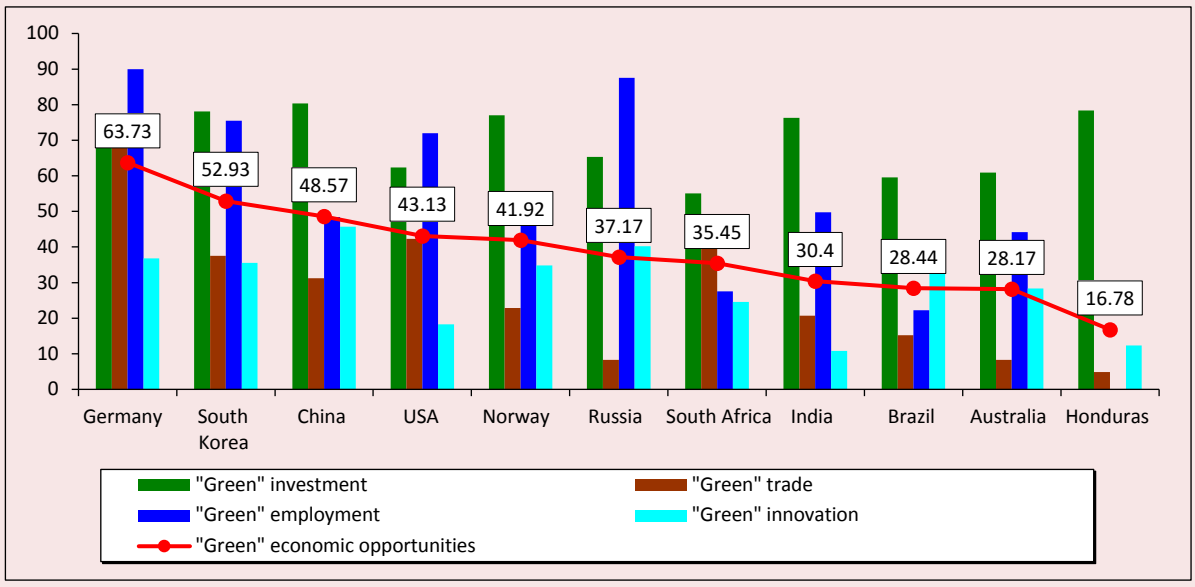
economy – the "green" economy. This conclusion is clearly confirmed by the values of the Global Green Economy Index (GGEI), developed by the American consulting company Dual Citizen and first calculated in 2010 (in Russia in 2016). According to the results of the 2018 GGEI calculation conducted in 130 countries across four dimensions (leadership and climate change, efficiency sectors, markets and investment, and the environment), among five of the world's largest economies, Germany shows the strongest performance in the overall index (ranked 6th; GCEI = 0.69), followed by Japan (19th; GCEI = 0.59), China (28th; GCEI = 0.55), the United States (31st; GCEI = 0.55), and India (36th; GCEI = 0.54); *Fig. 1*). It is noteworthy that Russia ranked only 103rd

Figure 1. Global Green Economy Index, 2018



Source: Dual Citizen official website. Available at: https://dualcitizeninc.com (accessed: April 4, 2022).

Figure 2. Green economic opportunities of some countries, 2020



Source: GGGI Technical Report. 2020. No. 16 (accessed: April 4, 2022).

(GGEI = 0.41), despite its ranking 6th according to the Green Economic Opportunities indicator, the value of which was 37.17%.

For comparison: the GEO value for Germany was 63.73, for China – 48.57 *(Fig. 2)*.

The need for radical economic transformations in the 21st century and the recognition of the environmental aspect of economic activity as imperative is indicated, among other things, by the fact that most countries show such a negative trend as the increasing ecological footprint of humanity and/or the growing shortage of bio-capacity (our environmental assets). A visual representation of the 2008–2018 dynamics of these indicators in some industrialized countries that to a greater or lesser extent supported the UNDP Green New Deal can be obtained on the basis of the data in *Table 1*.

Table 1. Dynamics of the ecological footprint and the shortage (surplus) of biocapacity per person in 2008–2018, global hectares

Country	Indicator	Year										
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	Biocapacity per person	0.88	0.88	0.9	0.9	0.91	0.9	0.9	0.93	0.92	0.92	0.92
	Ecological footprint per person	2.81	3.05	3.22	3.39	3.45	3.56	3.53	3.51	3.45	3.62	3.8
	Biocapacity reserve/shortage	**-1.93**	**-2.17**	**-2.32**	**-2.49**	**-2.54**	**-2.66**	**-2.63**	**-2.58**	**-2.53**	**-2.7**	**-2.88**
South Korea	Biocapacity per person	0.7	0.7	0.68	0.67	0.65	0.66	0.66	0.65	0.65	0.65	0.64
	Ecological footprint per person	5.7	5.42	5.86	5.9	5.76	5.73	5.64	5.77	5.88	6.17	6.32
	Biocapacity reserve/shortage	**-5**	**-4.72**	**-5.18**	**-5.23**	**-5.11**	**-5.07**	**-4.98**	**-5.12**	**-5.23**	**-5.52**	**-5.68**
Germany	Biocapacity per person	1.8	1.82	1.76	1.65	1.7	1.72	1.78	1.7	1.63	1.6	1.49
	Ecological footprint per person	5.57	5.15	5.55	5.42	5.22	5.24	5.06	4.95	4.83	4.81	4.67
	Biocapacity reserve/shortage	**-3.77**	**-3.33**	**-3.79**	**-3.77**	**-3.52**	**-3.52**	**-3.28**	**-3.25**	**-3.2**	**-3.21**	**-3.18**
USA	Biocapacity per person	3.6	3.63	3.56	3.43	3.4	3.45	3.47	3.44	3.54	3.4	3.39
	Ecological footprint per person	9.26	8.46	8.79	8.34	7.95	8.18	8.11	7.96	8.06	7.97	8.12
	Biocapacity reserve/shortage	**-5.66**	**-4.83**	**-5.23**	**-4.91**	**-4.55**	**-4.73**	**-4.64**	**-4.52**	**-4.52**	**-4.57**	**-4.73**
Norway	Biocapacity per person	8.01	7.82	7.77	7.58	7.45	7.32	7.29	7.23	7.16	7.08	6.91
	Ecological footprint per person	6.94	6.13	7.15	6.36	6.17	6.42	6.12	5.8	5.44	5.73	5.67
	Biocapacity reserve/shortage	**1.07**	**1.69**	**0.62**	**1.22**	**1.28**	**0.9**	**1.17**	**1.43**	**1.72**	**1.35**	**1.24**
RF	Biocapacity per person	6.86	6.77	6.49	6.75	6.5	6.62	6.68	6.66	6.75	6.83	6.72
	Ecological footprint per person	5.57	5.08	5.28	5.79	5.48	5.56	5.41	5.08	5.07	5.27	5.31
	Biocapacity reserve/shortage	**1.29**	**1.69**	**1.21**	**0.96**	**1.02**	**1.06**	**1.27**	**1.58**	**1.68**	**1.56**	**1.41**

Compiled according to: Data Sources: National Footprint and Biocapacity Accounts 2022 edition (Data Year 2018); GDP, World Development Indicators, The World Bank 2020; Population, U.N. Food and Agriculture Organization.

In the Russian Federation, despite its autonomous economic recession of 2013–2017, there was an increase in the ecological footprint and a reduction in biocapacity per person. And although the country's "green" environmental opportunities *(Fig. 2)* allow it to maintain a surplus of biocapacity for the time being, the resource and environmental limitations of the raw-materials exporting model of growth are becoming more and more apparent.

In general, at present there is a situation that requires a new solution to the urgent problem of restoring long-term sustainable growth of TFP in line with the global ESG agenda. This growth should be generated by ecological ("green") innovations – new technologies, production processes, supply chains that help to solve the issues of waste processing and industrial reproduction of raw materials from waste resources, as well as the use of alternative energy sources (Banerjee, Duflo, 2019). The solution of this super-global task, which has not yet been fully realized by society, requires advance large-scale environmental investments – "the sacrifice that is being made now for the sake of future benefits"[10] (Spence, 2012).

Based on the above, we think it is possible to consider environmental investments as a specific type of economic resources (monetary, material and intellectual investments) that can be directed to:

• increasing the efficiency of resource use, leading to their savings (for example, energy efficiency and energy conservation, waste reduction and recycling);

• replacing traditional technology with environmentally friendly or low-carbon technology operating in accordance with the principles of a closed resource cycle (for example, renewable energy sources; fundamentally new, breakthrough technologies that exclude the appearance of waste, industrial reproduction of raw materials from waste);

• improving the state of ecosystems and improving the quality of the environment (climate adaptation, forest planting, wetlands renewal, etc.) (Kormishkina et al., 2021).

In this sense, environmental investment is consistent with the well-known 17 Sustainable Development Goals (SDGs) for the period from 2016 to 2030 for all countries[11], which were formulated in the UN conceptual documents and approved at the UN Conference in 2015:

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
10. Reduce income inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient, and sustainable.

[10] Spence M. High growth sectors in the post recovery decade. Available at: https//www.project–syndicate.org(commentary/post–covid–high–grouth–sectors–6y–michael–spense–2021–04.2021

[11] UN Sustainable Development Goals. Available at: https://www.un.org/sustainabledevelopment /ru/sustainable-development-goals/ (accessed: April 4, 2022).

12. Ensure sustainable consumption and production patterns.

13. Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.

14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

As we can see, the mentioned goals cover all components of sustainable development – social, economic and environmental, and consider its institutional aspects, including systemic and structural barriers (poverty, inequality, environmental challenges, institutional structures, etc.) and their overcoming. It is noteworthy that seven goals (6, 7, 11–15) in this list are environmental (they relate to water resources, energy sources, environmental sustainability of cities and settlements, climate change, ecosystems of land, seas and oceans, etc.).

The comparative analysis of the content of the SDGs and the directions (targets) of environmental investment outlined above allows us to conclude that a significant part of them are not only interconnected, but also complement each other, and their joint solution can give, along with environmental, economic and social effects *(Tab. 2)*.

Given the noted interrelationship and complementarity of the SDGs and environmental investment goals, we can say that the latter can be considered as responsible in their essence and transformative in their functional role. We must add that environmental investment can bring high profits to economic entities, under certain market conditions, primarily through the use of advanced innovation technology in a wide range of areas focused on the industrial reproduction of raw materials and the production of high-tech products from waste resources, as well as meeting their growing need for environmental protection systems; as for society, it needs new high-tech jobs in economic sectors with low CO_2 emissions, the preservation of natural capital and the improvement of ecosystems, energy independence and, ultimately, the transition to a progressive ("green") economic model.

Table 2. Sustainable Development Goals and priority areas for environmental investment

Main priorities of environmental investment	Sustainable Development Goals																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Improving resource efficiency (e.g. waste reduction, energy efficiency)						+	+	+	+		+	+		+			
2. Replacing traditional technologies with environmentally friendly or low-carb ones in accordance with the principles of a closed cycle (VEI, waste recycling)		+		+		+	+	+	+			+					+
3. Improving the state of ecosystems and environmental quality (climate adaptation, forest planting, wetlands renewal, etc.)	+		+			+		+	+	+	+	+	+	+	+		
Source: own compilation.																	

The conclusion about the transformative role of environmental investments can be concretized, in addition to the above, from the standpoint of the theory of endogenous economic growth and J. Schumpeter's well-known concept, which explain in precise terms "what the economic incentives for innovation are and how this dynamics works" (Spence, 2012).

We should note that, based on the previously identified priority areas of environmental investments, they are a priori associated with "green" innovations in the form of the latest, breakthrough environmentally friendly technology (or waste-free technology), providing deep cleaning of the final product and all target components of the environment; mandatory waste recycling and the use of alternative energy sources; production of new high-tech goods as a result of industrial reproduction of raw materials. We can argue that environmental investment gives impetus to the following radical changes in the 21st century economy:

- economic development will not depend on the consumption of raw materials;
- the use of non-renewable energy sources (oil, gas, coal) will be reduced;
- the technogenic impact of energy on the environment will decrease;
- new high-tech jobs will be created in economic sectors with low CO_2 emissions, etc.

Thus, the prospects for the formation and development of such technologies are limitless, which opens up wide opportunities for innovation business, and therefore for ensuring long-term sustainable growth of TFP.

Awareness of the increasing role of environmental investments in ensuring radical economic transformations in the 21st century and in promoting long-term sustainable growth of TFP is accompanied by their positive dynamics in different countries. For example, the share of such expenses in anti-crisis packages in 2020 in South Korea reached 81%, in the EU – 59%, in China – 38%, in the U.S. – 12% (Mirkin, 2020).

At the same time, we regret to state that, despite the possibility of obtaining the previously mentioned benefits from environmental investment, Russia still faces a number of factors and barriers that restrain the effects of this type of investment; the barriers include putting the environmental goals behind the economic ones for the state and business; slow introduction of high-tech "green" innovations, including circular ones, into the economy (Lipina et al., 2018) due to outdated raw materials structure and high level of corruption; inefficient balance of the tax system; lack of a clear and understandable system of state support for such investments; uncertainty of investors in the "green" ("circular") economy, their commitment to the current concept of production; poor development of relevant competencies in the financial sector.

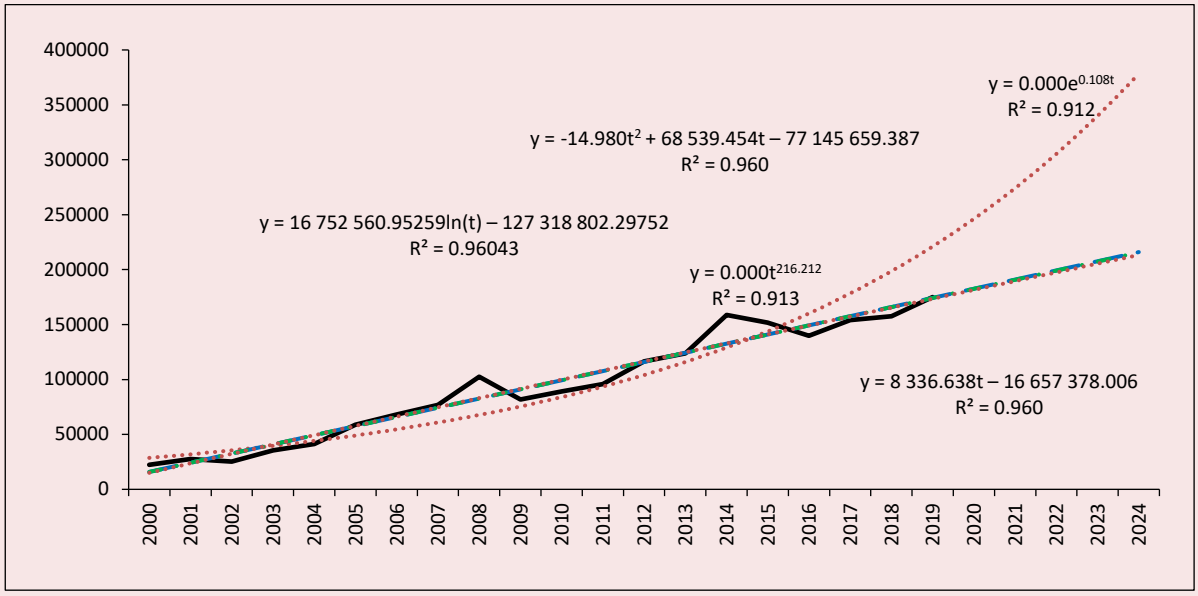
The above factors in Russia are difficult to overcome; thus, in the framework of our study we built regression models in order to forecast the volume of investments in fixed assets aimed at environmental protection and rational use of natural resources in the Russian Federation for 2022–2024 *(Fig. 3)*.

The statistics of the regression models (growth curves) presented in Figure 3 are shown in *Table 3*.

The analysis of the data in Table 3 allows us to conclude that the general trend in the volume of investments in fixed assets in the RF aimed at environmental protection and rational use of natural resources in the forecast perspective can be most accurately expressed by a linear trend model with the smallest approximation error (10.39%):

$$Y_t = 8336{,}63835\text{t} + 7562{,}04737 + \varepsilon. \qquad (6)$$

Figure 3. The volume of investments in fixed assets in the Russian Federation aimed at environmental protection and rational use of natural resources: Dynamics and forecasting for 2022–2024



Source: own calculation.

Table 3. Trend models (growth curves) of analysis and forecasting of the dynamics of the volume of investments in fixed assets in the Russian Federation aimed at environmental protection and rational use of natural resources

Trend equation (growth curve)	Criterion of model quality		Forecast		
	Coefficient of determination	Average approximation error, %	2022	2023	2024
$Y = 8336.63835t + 7562.04737 + \varepsilon$	0.960	10.39	199304.73	207641.37	215978.01
$Y = -14.97955t^2 + 8651.20892t + 6408.62193 + \varepsilon$	0.960	10.57	205386.43	214037.64	222688.85
$Y = 25719.78432 \cdot e^{0.10756t} \cdot \varepsilon$	0.912	16.66	305255.75	339920.03	378520.71
$Y = 56151.83796lnt - 23764.38378 + \varepsilon$	0.8222	32.36	152299.38	154689.18	156981.41
$Y = 14874.28795 \cdot t^{0.79225} \cdot \varepsilon$	0.934	12.50	178344.35	184460.24	190523.39
Source: own calculation.					

This regression model, in addition, emphasizes insufficient intensity of environmental investment, as well as the economic tools of its state support that are still poorly used in the Russian Federation.

Econometric model of the dependence of economic growth on the volume of environmental investments, taking into account their priorities

As part of an experimental testing of the proposed scientific hypothesis, an econometric model was constructed that reflects the dependence of economic growth (volume of GDP per capita in the Russian Federation) on the volume of investments in fixed assets aimed at environmental protection and rational use of natural resources to assess the long-term and short-term response of economic growth indicators on the volume of investments, taking into account their main priorities (resource conservation and resource efficiency; improving the state of the ecosystem and improving the quality of the environment) and including lag independent variables as regressors. In accordance with the hypothesis formulated in our study, we determined the maximum values of the lag l and the degree k of the polynomial (2) describing the structure of the lag for each dynamic regression (1), while experimentally (using correlation regression analysis, testing Student hypotheses, estimates of t-statistics) we found that to estimate the regression parameters and (1) it is advisable to use 3rd-degree polynomials (7):

$$\beta_j = c_0 + c_1 j + c_2 j^2 + c_3 j^3,$$
$$\gamma_i = d_0 + d_1 i + d_2 i^2 + d_3 i^3. \quad (7)$$

Using the method of instrumental variables, in order to reduce the multicollinearity of exogenous variables, the parameters of the model (4) were evaluated for the first equation with a distributed lag of the system (1):

$$Y_{1t} = -25638.55 + \underset{(0.02)}{17.14} Z_0 - \underset{(0.07)}{30.90} Z_1 + \underset{(0.03)}{14.39} Z_2 + \varepsilon_t,$$
$$F = 73.83, \quad (8)$$

where the new instrumental values look like this (8).

$$Z_0 = X_{1t} + X_{1t-1} + X_{1t-2} + X_{1t-3},$$
$$Z_1 = X_{1t-1} + 2X_{1t-2} + 3X_{1t-3},$$
$$Z_2 = X_{1t-1} + 4X_{1t-2} + 9X_{1t-3}, \quad (9)$$

Calculating the values of lag variables X_{1t-1}, X_{1t-2}, X_{1t-3} and variables Z_0, Z_1 and Z_2 (9) to estimate the parameters of a dynamic econometric model of the dependence of the growth rate of fixed capital investments in the Russian Federation aimed at environmental protection and rational use of natural resources (Y_{1t}), on the growth rate of the formation and processing of production and consumption waste (X_{1t}), the multiple regression equation (10) was constructed:

$$Y_{1t} = -25638.55 + 17.14X_{1t} + 0.63X_{1t-1} + 12.88X_{1t-2} + \varepsilon_t. \quad (10)$$

The analysis of the econometric model (10) allows us to conclude that an increase in the generation of production and consumption waste by 1 million tons in the current period in one year should be accompanied by an increase in the volume of investments in fixed assets in the Russian Federation aimed at environmental protection and rational use of natural resources by 17.80 million rubles, in two years – by 30.68 million rubles to protect the integrity of the environment.

Since the initial data for the second equation of the model (1) have a lognormal distribution, the parameters are estimated for the logarithms of the dynamics series under consideration. The dynamic regression model of the dependence of the volume of gross domestic product per capita (Y_{2t}) on the volume of investments in fixed assets aimed at environmental protection and rational use of natural resources (Y_{1t}) is as follows (11):

$$\ln(Y_{2t}) = \alpha + \gamma_0 \ln(Y_{1t}) + \gamma_1 \ln(Y_{1t-1}) + \gamma_2 \ln(Y_{1t-2}) + \cdots + \gamma_l \ln(Y_{1t-l}) + u_t. \quad (11)$$

Using the method of instrumental variables for the model (11), we estimate the parameters for the new variables Z_0, Z_1, Z_2 (12):

$$\ln(Y_{2t}) = -9584.504 + \underset{(0,001)}{0.366} \cdot Z_0 - \underset{(0,044)}{0.462} \cdot Z_1 + \\ + \underset{(0,056)}{0.143} \cdot Z_2 + \varepsilon_t, F = 201.46. \quad (12)$$

After performing inverse transformations (5) of the model parameters (12), we obtained the second dynamic regression equation with a distributed lag (13) of the system (1):

$$\ln(Y_{2t}) = -9584.504 + 0.366 \cdot \ln(Y_{1t}) + \\ + 0.047 \cdot \ln(Y_{1t-1}) + 0.014 \cdot \ln(Y_{1t-2}) + \\ + 0.266 \cdot \ln(Y_{1t-3}) + u_t. \quad (13)$$

The analysis of the constructed model (13) allows us to conclude that an increase in the volume of investments in fixed assets aimed at environmental protection and rational use of natural resources (Y_{1t}) by 1% in the current period will lead to an average increase in the volume of gross domestic product per capita (Y_{2t}) by 0.366%; by 0.413% – for the next year; 0.426% – in a year; 0.693% – in two years.

$$\begin{cases} \ln(Y_{2t}) = -9584.504 + 0.366 \cdot \ln(Y_{1t}) + \\ \quad + 0.047 \cdot \ln(Y_{1t-1}) + 0.014 \cdot \ln(Y_{1t-2}) + \\ \quad + 0.266 \cdot \ln(Y_{1t-3}) + u_t \\ Y_{1t} = -25638.55 + 17.14 \cdot X_{1t} + \\ \quad + 0.63 \cdot X_{1t-1} + 12.88 \cdot X_{1t-2} + \varepsilon_t. \end{cases} \quad (14)$$

Thus, the system of dynamic regression models (14) confirms the expediency of abandoning the raw materials exporting model of growth of the Russian economy in favor of the investment model. In addition, it provides a reason to consider environmental investment as a powerful factor in ensuring sustained economic growth without harming the environment, which means the "active start" of the transformation of the Russian economy in accordance with the requirements of the global ESG agenda.

Discussion

Economic stimulation of environmental investment in Russia

Studying and generalizing the practical experience of the world's leading countries on the use of various mechanisms and economic instruments of state policy in the field of stimulating environmental investment was the basis for the following recommendations to ensure an integrated approach to the formation of such a policy in post-pandemic Russia.

1. Achieving a rational (marginal) value for the share of gross investment accumulation in GDP, a generalizing indicator of the stability and security of investment activity. Environmental investment, which involves replacing traditional technology with environmentally friendly or low-carbon one, improving the quality of the environment, etc., focuses on the development of knowledge-intensive and innovative and capital-intensive industries and sectors of the economy. In such circumstances, we find it appropriate to increase the share of gross investment accumulation in the GDP of the Russian Federation from the current 21.9% (2020) to at least 28–30%. Against this background, there is a need for a reliable mechanism for transforming the funds accumulated by the population into environmental investments; this can be implemented by guaranteeing full repayment of deposits in case of any defaults and accruing increased interest when they are invested in "green" securities lending to environmental investment projects.

2. Increasing the attractiveness of environmental investments for private capital through a policy of lowering prices for low-carbon investment projects. Such a policy means the development and

implementation of environmental standards and norms, environmental management and auditing (ISO14000, EMAS) into economic practice; the use of state guarantees for loans to clean technologies and "green" firms; rejecting the subsidies that encourage the use of hydrocarbon energy (oil, coal) and deplete natural capital, and, conversely, subsidizing clean energy and clean technology; development of a system of benchmarks to verify the "reliability" of environmental investments; creating territories (initiative of the PRC) for "testing" a system of carbon emissions trading, units of their reduction (credits or offsets, units of CO_2 absorption and other carbon units). There is no doubt that such a policy requires strong political will. At the same time, it is obvious that in the end it contributes to the gradual transformation of environmental responsibility into an economic asset.

3. Designing a new financial and economic mechanism, the distinctive features of which are resource conservation and maximum involvement of production and consumption waste in economic turnover as adequate sources of raw materials and energy for the latest global environmental challenges. The implementation of this direction for promoting environmental investment involves:

– modernization of pricing according to the principle of social justice, which means the need to determine the full amount of production costs, including the cost of waste processing; besides, the fees for further recycling of these products (in the form of a small sum) should be paid by their consumer;

– state guarantees in the form of subsidies to reimburse part of the cost of paying interest on loans and borrowings attracted by private investors for the implementation of environmental projects;

– providing a set of benefits and preferences (for example, tax benefits and deductions, preferential rates on loans) to economic entities that process waste using circular technology and supply secondary raw materials with improved environmental qualities, and, conversely, creating conditions under which it becomes economically unprofitable for the owner of waste to store waste (waste collection and disposal tax).

4. Improving environmental literacy of population and business. Urging the business and public to understand what harm to the environment and human health is caused by today's production patterns.

Conclusion

In economics, the future is evaluated through the prism of economic development prospects, which, as we know, are specified in such a category as economic growth and are characterized by its dynamics and structure. In the current situation that has developed in Russia under the influence of an economic recession caused by the pandemic and external sanctions pressure on the national economy, the need to abandon the raw materials exporting (rental) model of economic growth in favor of an effective investment model corresponding to the requirements of the global ESG agenda, in which the environmental aspect associated with the responsible attitude of business toward nature is of fundamental importance.

Summarizing the above, we point out that our study contributes to the increment of scientific knowledge in the following:

1) theoretical substantiation of a scientific hypothesis that environmental investments in the conditions of planetary manifestations of environmental growth constraints should be recognized as a key factor in ensuring long-term sustainable growth of total factor productivity; the work contains original scientific judgments concerning the impact of environmental investment on the promotion of "green" innovations (environmentally

friendly technology or waste-free technology; new high-tech products obtained as a result of industrial reproduction of raw materials, etc.), capable of generating sustained economic growth in the long term;

2) promotion and theoretical substantiation of the scientific idea of the need to consider environmental investment as an "active start" of radical transformations of the economy in the 21st century, provided by the formation of a "green" economy; in this regard, it has been proved that it is environmental investments that are important for sustainability, but less attractive for business, that can bring profit to economic entities and satisfy their growing need for environmental protection systems; the benefits for society include creating new high-tech jobs in economic sectors with low CO_2 emissions, preserving natural capital and improving the state of ecosystems, energy security and the transition to a "green" (circular) economy;

3) experimental testing of the hypothesis of environmental investment as a key factor in ensuring sustainable economic growth by constructing an econometric model; the model is a system of dynamic economic regressions with a distributed lag of a polynomial structure; it can be used to assess the long-term and short-term response of economic growth indicators from environmental investment;

4) a minimum set of necessary economic tools was proposed to be used by state policy in the field of stimulating environmental investment in modern Russia.

We note that the subject area of environmental investment is in its infancy. In this regard, it is necessary to study in more depth the nature and features of environmental investments (new investment conditions, the rate and nature of profit, payback periods, the structure of the capital market, etc.) in order to specify the mechanisms of their impact on economic growth and transformation of the economy and society.

References

Animitsa E.G., Dvoryadkina E.E., Kvon T.M. (2020). Transformative investments – the mainstream of region development. *Vestnik Belgorodskogo universiteta kooperatsii, ekonomiki i prava=Herald of the Belgorod University of Cooperation, Economics and Law,* 4(83), 83–95 (in Russian).

Banerjee A., Duflo E. (2019). *Good Economics for Hard Times.* New York: Public Affairs.

Bobylev S.N. (2020). Sustainable development: a new vision for the future? *Voprosy politicheskoi ekonomiki=Problems in Political Economy,* 1(21), 67–83. DOI: 10.5281/zenodo.375332 (in Russian).

Bobylev S.N., Kiryushin P.A., Koshkina N.R. (2021). New priorities for the economy and "green" financing. *Ekonomicheskoe vozrozhdenie Rossii=Economic Revival of Russia,* 1(67), 152–166. DOI: 10.37930/1990-9780-2021-1-67-152-166 (in Russian).

Daskovskii V.B., Kiselev V.B. (2016). *Novyi podkhod k ekonomicheskomu obosnovaniyu investitsii* [A New Approach to the Economic Justification of Investments]. Moscow: Kanon+; ROON Reabilitatsiya.

Fishman L.G., Mart'yanov V.S., Davydov D.A. (2019). *Rentnoe obshchestvo: v teni truda, kapitala i demokratii* [Rent Society: In the Shadow of Labor, Capital and Democracy]. Moscow: Izd. dom Vysshei shkoly ekonomiki. DOI: 10.17323/978-5-7598-1913-4

Fücks R. (2019). *Zelenaya revolyutsiya: ekonomicheskii rost bez ushcherba dlya ekologii* [Intelligent Growth – The Green Revolution]. Translated from German. Moscow: Al'pina nonfikshn.

Glazyev S.Yu. (2018). *Ryvok v budushchee. Rossiya v novykh tekhnologicheskom i mirokhozyaistvennom ukladakh* [A Leap into the Future. Russia in New Technological and Economic Paradigms]. Moscow: Knizhnyi mir.

Gordon R. (2016). *The Rise and Fall of American Growth*. New York: Princeton University Press.

Griffiths W.E., Hill R.C., Judge G.G. (1993). *Learning and Practicing Econometrics*. New York: Wiley.

Grinberg R.S. (2008). Does Russia have a future that does not depend on its commodities? *Vestnik IE RAN=Bulletin of the Institute of Economics of the Russian Academy of Sciences,* 1, 6–21 (in Russian).

Gubanov S.S. (2012). *Derzhavnyi proryv. Neoindustrializatsiya Rossii i vertikal'naya integratsiya* [Breakthrough of the Power. Neoindustrialization of Russia and Vertical Integration]. Moscow: Knizhnyi mir.

Ivanova I.A., Busalova S.G., Gorchakova E.R. (2021). Regional investment market in the sphere of waste management: Dynamics, structure, evaluation methodology. *Regionologiya=Russian Journal of Regional Studies,* 29(4), 840–865. DOI: https://doi.org/10.15507/2413- 1407/117/029/202104/840-865 (in Russian).

Jackson T. (2009). *Prosperity without Growth: Economics for a Finite Planet*. Earth can Publications Ltd.

Jackson T. (2017). *Prosperity without Growth? Foundations for the Economy of Tomorrow*. Routledge.

Kormishkina L.A., Kormishkin E.D., Koroleva L.P., Koloskov D.A. (2018). Recycling in modern Russia: Need, challenges, and prospects. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 11(5), 155–170. DOI: 10.15838/esc.2018.5.59.10 (in Russian).

Kormishkina L.A., Kormishkin E.D., Sausheva O.S., Koloskov D.A. (2021). Economic incentives for environmental investment in modern Russia. *Sustainability,* 13(21). DOI: 10.3390/su132111590

Lipina S.A., Agapova E.V., Lipina A.V. (2018). *Razvitie zelenoi ekonomiki v Rossii: vozmozhnosti i perspektivy* [Development of the Green Economy in Russia: Opportunities and Prospects]. Moscow: LENAND.

Matveeva L.G., Gridnev D.S. (2022). Applying a set of circular economy methods in analyzing national risks in the context of neoindustrialization. *Estestvenno-gumanitarnye issledovaniya=Natural-Humanitarian Studies*, 39(1), 179–187. DOI: 10.24412/2309-4788-2022-1-39-179-187 (in Russian).

Mirkin Ya. (2020). How to resist recession: What to do? *Nauchnye trudy Vol'nogo ekonomicheskogo obshchestva Rossii=Scientific Works of the Free Economic Society of Russia,* 223(3), 188–196. DOI: 10.38197/2072-2060-2020-223-3-188-196 (in Russian).

Pittel K., Amigues J-P., Kuhn T. (2010). Recycling under a material balance constraint *Resource and Energy Economics,* 32(3), 379–394.

Rakov V.D. (2017). Mechanisms of support of "green" projects financing: Experience of countries. *Aktual'nye problemy ekonomiki i prava=Russian Journal of Economics and Law,* 11(2), 67–82. DOI: https://doi.org/10.21202/1993-047X.11.2017.2.67-82 (in Russian).

Schwab K. (2017). *Chetvertaya promyshlennaya revolyutsiya* [The Fourth Industrial Revolution]. Translated from English. Mosocw: Eksmo.

Spence M. (2012). *The Next Convergence: The Future of Economic Growth in Multispeed World*. New York: Farrar, Straus and Giroux.

Spiridonova A.V. (2020). Environmental investment in the Russian Federation: A theoretical and legal approach. *Vestnik YuUrGU. Seriya "Pravo"=Bulletin of the South Ural State University. Ser. Law,* 20(1), 72–79. DOI: 10.14529/law200111 (In Russian).

Sukharev O. (2019). Investment model of economic growth and structural policy. *Ekonomist,* 1, 23–52 (in Russian).

Sukharev O., Voronchikhina E. (2020). Structural dynamics of the economy: Impact of investment in old and new technologies. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 13(4), 74–90. DOI: 10.15838/esc.2020.4.70.4 (in Russian).

Yakovlev I.A., Kabir L.S., Nikulina S.I., Rakov I.D. (2017). Financing green economic growth: conceptions, problems, approaches. *Finansovyi zhurnal=Financial Journal,* 3, 9–20 (in Russian).

Information about the Authors

Lyudmila A. Kormishkina – Doctor of Sciences (Economics), Professor, head of department, Ogarev Mordovia State University (68, Bolshevistskaya Street, Saransk, Republic of Mordovia, 430005, Russian Federation; e-mail: kormishkinala@mail.ru)

Evgenii D. Kormishkin – Doctor of Sciences (Economics), Professor, professor of department, Ogarev Mordovia State University (68, Bolshevistskaya Street, Saransk, Republic of Mordovia, 430005, Russian Federation; e-mail: kormishkined@mail.ru)

Irina A. Ivanova – Candidate of Sciences (Economics), Associate Professor, associate professor of department, Ogarev Mordovia State University (68, Bolshevistskaya Street, Saransk, Republic of Mordovia, 430005, Russian Federation; e-mail: ivia16@mail.ru)

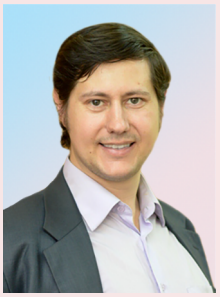
Dmitrii A. Koloskov – Candidate of Sciences (Economics), Associate Professor, associate professor of department, Ogarev Mordovia State University (68, Bolshevistskaya Street, Saransk, Republic of Mordovia, 430005, Russian Federation; e-mail: Kda1977@mail.ru)

Received June 6, 2022.

DOI: 10.15838/esc.2022.4.82.9
UDC 332, LBC 65.9

Elaborating a Methodology for Assessing the Impact of Innovation Entrepreneurship on the Development of the Region's Economy

Semen L.
IVANOV
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: slivanov2020@mail.ru
ORCID: 0000-0002-4647-5824



Aleksandr I.
METLYAKHIN
Vologda State University
Vologda, Russian Federation
e-mail: metlyahin.ai@yandex.ru
ORCID: 0000-0003-0449-0396; ResearcherID: ABH-7573-2020

Abstract. Along with the transition of the Russian economy to innovation development, the role of innovation entrepreneurship as a driver of intensive economic growth has significantly increased. This type of entrepreneurship provides regions with competitive advantages. The purpose of the study is to assess the extent of influence of innovation entrepreneurship on the level of economic development of Russian regions by testing the technique of regression analysis of panel data. In order to achieve this goal, we addressed the following tasks: first, we reviewed scientific papers that investigate the influence of the innovation factor (including innovation entrepreneurship) on the development of the regional economy; second, we selected and scientifically substantiated the choice of statistical indicators that reflect, on the one hand, the development of innovation entrepreneurship and on the other – the development of the economy of Russian regions; third, we analyzed the impact of innovation entrepreneurship on the

For citation: Ivanov S.L., Metlyakhin A.I. (2022). Elaborating a methodology for assessing the impact of innovation entrepreneurship on the development of the region's economy. *Economic and Social Changes: Facts, Trends. Forecast,* 15(4), 136–154. DOI: 10.15838/esc.2022.4.82.9

economic development of Russian regions on the basis of the indicators selected and with the use of econometric tools. We applied the following scientific methods: systematization, generalization, study of literature, documents, and results of activities. We should separately highlight the method of mathematical modeling that we used to perform a regression analysis. The following results were obtained: first, on the basis of the review, we found that innovation entrepreneurship has a significant impact on the development of the economy of regions, especially during recession periods; second, the results of the regression analysis allowed us to confirm the hypothesis that innovation entrepreneurship should be considered a significant factor in economic development of Russian regions. We also revealed that in the conditions of the modern domestic economy, the technological component of innovation entrepreneurship (the essence of which is the development of innovative solutions) is the most prominent one.

Key words: innovation entrepreneurship, region, gross regional product, indicator, innovative solution, innovation product, regression analysis, modeling, panel data.

Acknowledgment

The article was prepared in accordance with the topic of state task FMGZ-2022-0002 "Methods and mechanisms of socio-economic development of Russian regions in the context of digitalization and the Fourth Industrial Revolution".

Introduction

Economic scientists have always paid considerable attention to the problem of identifying factors and finding sources of economic development. A striking example is the protectionist economic policy developed within the framework of mercantilism, the main provisions of which proclaimed the establishment of high import duties, support for national producers, etc. (De Santis, W. Stafford, T. Mann, A. de Montchrestien) (Gadzhiev, 2017; Cwik, 2011).

A. Smith believed that the foundation of economic development within a particular socio-economic system consists in its absolute advantages, that is, factors that ensure the possibility of producing more goods using a constant amount of resources. For example, favorable agro-climatic conditions can be considered as absolute advantages for most agricultural areas. Developing the theory of A. Smith, D. Ricardo introduces the term "comparative advantages". In his opinion, even if the region does not have absolute advantages, this does not mean that the production of any good is not profitable for it. According to D. Ricardo's theory, the time spent on producing a unit of goods is the main condition for ensuring competitiveness in the production process (Fenin, 2017; Shumacher, 2012a, Shumacher, 2012b).

Representatives of institutionalism (W. Hamilton, T. Veblen, J. Galbraith, J. Commons, etc.) assigned a special role in economic development to social institutions. According to J. Keynes, state regulation of the economy (in particular, its influence on aggregate demand) is the basis of its stability and subsequent development, as well as the main tool for overcoming crisis situations. J. Schumpeter, the founder of the Theory of Innovation (The Theory of Economic Development, 1911), believed that innovation is recognized as the dominant factor ensuring the development of an economic system (Kurz, 2007; Bessy, Favereau, 2010; Kovaleva, 2015; Salamova, 2020; Hospers, 2005; Dequech, 2012; Caballero, Soto-Oñate, 2015).

We can find a lot of similar examples in the history of economic teachings. However, we should note that, so far, scientists have not come to a single

conclusion about which factors have the greatest impact on economic development.

With the advent of regionalism and regional economics (the first half of the 20th century), the research into the factors that influence economic development in individual territorial units became most widespread. This was due to the fact that in the conditions of an industrial and post-industrial society, the region became a complex multicomponent system whose structure and specifics were in no way inferior to the state as a whole. In many cases, the development of a State is determined by the development of its individual regions.

It is important to note that in the context of this study we will consider the term "region" from the standpoint of an administrative-territorial approach (G.V. Gutman, V.I. Leskin, A.V. Shvetsov, K. Deutsch, etc.). Thus, the region will be identified with the notion of constituent entity of the federation (or a group of entities, for example, an economic district or a federal district) (Leksin, Shvetsov, 1997; Gutman, 2002). The choice is due to the fact that the data for the regression analysis carried out in the framework of the work are taken for each RF region where the region is an administrative-territorial unit (that is, a constituent entity of the federation).

Relevance of the research. In the context of global resource constraints accompanied by pessimistic forecasts about considerable depletion of natural resources and food reserves, a tense military-political situation, and a number of other circumstances, one of the ways to solve the problem for our country is to develop an innovation-oriented paradigm of socio-economic development. Gradually, Russia should transform from an exporter of raw materials into a technologically advanced power producing a high share of added value (Polyanskaya, Naidenova, 2015).

The modern reproduction system needs to develop and implement innovations at almost all stages – from production to consumption. Old technologies that have exhausted their resource cannot help Russian regions (and Russia as a whole) to cope with competition and achieve their goals. This requires practical implementation of innovation in individual economic processes in the economy of each of RF constituent entities. Innovations act as a key factor in sustainable economic growth, contribute to the creation of a reliable material and non-material basis for the life of the present and future generations.

With the transition to the Fourth Industrial Revolution (sixth technological paradigm) The Russian Federation, like many other countries, has chosen an innovation "path" of development. In this regard, the formation of innovation entrepreneurship, innovation enterprises, etc. has become widespread. This is due to the fact that this type of entrepreneurship plays a key role in the innovation process. The function of implementing the most important stage of the innovation process (namely, the stage of commercialization of innovations) in a market economy is assigned to private innovation companies, which play a decisive role in the process of transferring a novelty into the innovation category. In addition, they participate in the creation of "innovative solutions" along with universities, research institutes, research centers, etc. Possessing financial resources, innovation business entities are able to conduct longitudinal and rather costly scientific research, which is often difficult to do within the framework of scientific organizations that are state-owned (since they are significantly limited by the financing factor) (Burkina, 2020; Oliveira, 2019).

Based on a review of a number of scientific papers (Zhil'nikov, 2014; Burkina, 2020; Kupriyanov et al., 2020; Golova, 2021; Smotritskaya, Chernykh; 2021; Oliveira, 2019; Oswald, 2019), as well as works by representatives of the theory of endogenous economic growth (P. Romer, R. Lucas, G. Grossman, P. Aghion, D. Audretch, A. Rodriguez-Pose, B. Jovanovich, etc.), whose research is the current mainstream in studying the impact of the innovation

factor on the economic development of regions, we can conclude that innovation entrepreneurship provides regions with competitive advantages through the use of qualitatively new means and objects of labor, production of goods with high added value, optimization of a number of production processes, savings on the use of natural resources, development of new market sectors and types of economic activity, creation of new jobs (including high-tech jobs) (Zadumkin, Terebova, 2009; Lucas, 1988; Grossman, Helpman, 1989; Romer, 1990; Rivera-Batiz, Romer, 1991; Romer, 1992; Nelson, Romer, 1996).

Innovation entrepreneurship obviously has a positive impact on the development of the regional economy; the works of both Russian and foreign researchers clearly prove it. Nevertheless, the acute scientific problem still consists in the lack of tools that allow for a comprehensive and objective assessment of the impact of innovation entrepreneurship on the economic development of regions (including an assessment of the degree of such influence).

Within the framework of our work, an attempt is made to solve this scientific problem by applying the methodology of regression analysis of panel data characterizing innovation entrepreneurship. We should note that previously the scientific literature did not use this tool on a wide-scale basis for solving the problem of assessing the impact of innovation business on regional economy. Some studies in which attempts have been made to conduct such an analysis do not consider the specifics of the data that have a panel structure; moreover, the range of indicators characterizing innovation entrepreneurship in these studies is insufficient (Zhil'nikov, 2014; Chelnokova, Sumarokova, 2014). At the same time, when eliminating these "gaps", we think that the choice of the above-mentioned methodology, due to the structure of the values of the indicators selected for analysis, is the most objective in solving the scientific problem we have defined. This assumption forms the basis of the scientific hypothesis of our study. The hypothesis is formulated as follows: the use of regression analysis of panel data will allow us to obtain consistent, statistically significant estimates of indicators characterizing innovation entrepreneurship and comprehensively characterize its impact on the development of the region's economy.

Russian regions will be considered as the object of the study. The subject of the research is innovation entrepreneurship as a driver of economic development of RF regions. It is worth noting that innovation entrepreneurship will be understood not only as small or medium-sized enterprises, but as entrepreneurship in general (including large business).

The purpose of the work is to assess the degree of influence of innovation entrepreneurship on the economic development of Russian regions.

To achieve this goal, it is necessary to address the following tasks:

1. To review scientific papers that examine the impact of innovation, as well as innovation entrepreneurship on the development of the regional economy.
2. To carry out and scientifically substantiate the selection of statistical indicators reflecting, on the one hand, certain aspects of the activity of innovation entrepreneurship, on the other hand, the development of the economy of Russian regions.
3. To analyze the impact of innovation entrepreneurship on the economic development of RF regions on the basis of the selected indicators through the use of econometric tools.

Literature review

Innovations are considered as a significant factor that promotes economic development. A number of scientists (A. Toffler, F. Fukuyama, D. Bell, etc.) believe that the majority of developed countries in the modern world have gained global economic superiority primarily with the help of innovation economy (Toffler, 1986).

Current practice and the works of Russian and foreign scientists prove the dependence of economic growth on the pace of development of scientific and technological progress (research by N.Ya. Tinergen, R. Solow, J. Hicks, etc.). The hypothesis put forward within the framework of the theory of endogenous economic growth about scientific and technological innovations as internal sources of constant growth has allowed us to develop a number of models of long-term economic growth provided, on the one hand, by investments in physical capital (machinery and equipment), on the other hand, by investments in human capital. Models with investments in the knowledge sector deserve special attention (Uskova, 2009; Rivera-Batiz, Romer, 1991; Nelson, Romer; 1996). In addition, according to P. Romer, there is an increasing public return on R&D spending (Romer, 1990).

It is worth noting that the Russian economy has chosen a course toward innovation development. However, innovation infrastructure facilities in Russia the were formed and developed with some lag behind other developed countries.

There are several main stages in the post-Soviet history of innovation. The period that took place in the 1990s is characterized by an almost complete lack of demand for innovations. The state innovation policy existed nominally – in the form of the Decree of the President of the Russian Federation dated April 27, 1992 no. 426 "On urgent measures to preserve the scientific and technological potential of the Russian Federation"[1]. Since at that time the domestic economy was commodity-heavy, representatives of extractive industries (mainly oil and gas corporations) were the main customers of innovations (Gretchenko, Monakhov, 2011).

The next stage (the 2000s) is characterized by a general rise in industrial production and the economy as a whole. Individual sectors began to demand scientific and technological achievements (including the light industry, the food industry, as well as the fuel and energy complex). State innovation policy was implemented through the formation of federal target programs, establishment of special economic zones, science towns and technology parks. The innovation policy was presented in the Letter of the President of the Russian Federation no. Pr-576 dated March 30, 2002 "Fundamentals of the policy of the Russian Federation in the field of science and technology development for the period through to 2010 and beyond"[2]. At this stage, associated with the completion of transition processes, there is a relatively stable situation in the field of innovation research. During the period under consideration, there has been a steady trend of increasing state participation in the innovation process (Gretchenko, Monakhov, 2011).

Among the Russian scientists and economists who dealt with the impact of the innovation factor on the economic development of regions during this period, we would like to highlight L.I. Abalkin, S.Yu. Glazyev and others (Abalkin, 2004; Glazyev, 2008; Glazyev, 2011; Glazyev, 2013a; Glazyev, 2013b). In particular, L.I. Abalkin studied the drivers of national economic development and noted the originality of the market economy model that gives top priority to an innovation approach to solving urgent economic problems (Abalkin, 2004).

The next stage (since the end of the 2000s) is characterized by the inclusion of innovation activities in the list of the main priorities of the country. During this period, the Foundation for the Development of the Center for the Development and Commercialization of New Technology (the Skolkovo Foundation) was established, the Strategy

[1] On urgent measures to preserve the scientific and technological potential of the Russian Federation: Presidential Decree 426, dated April 27, 1992 (amended September 30, 2012). Available at: http://www.consultant.ru/document/cons_doc_LAW_3269/

[2] Fundamentals of the policy of the Russian Federation in the field of science and technology development for the period through to 2010 and beyond: Presidential Letter Pr-576, dated Mach 30, 2002. Available at: http://www.consultant.ru/document/cons_doc_LAW_91403/

for Innovation Development of the Russian Federation for the period through to 2020 was approved, and the implementation of Order no. Pr-22 dated January 4, 2010 (Item 5, Sub-item "b") on the elaboration of innovation development programs (IDPs) was launched (Burkina, 2020). Amendments to legislation aimed at stimulating innovation are currently being discussed. Promoting innovation has been elevated to the status of a national project.

According to I.I. Smotritskaya and S.I. Chernykh (Smotritskaya, Chernykh, 2021), at the present stage, an economic model built on the basis of a continuous process of innovative renewal has no alternative in ensuring sustainable socio-economic development. It is worth noting that this opinion is shared by the majority of foreign and Russian scientists (Aganbegyan et al., 2020; Golova, 2021; Oswald, 2019). Nevertheless, we can encounter "polar" positions. In particular, Yu.V. Simachev and colleagues (Simachev et al., 2021) note that at the nationwide level, a positive relationship between productivity and innovation is not always observed. Some foreign authors (Ramadani et al, 2019) also adhere to this thesis, saying that the importance of innovation for productivity growth increases as we approach the technological frontier. In an economy far from the technological frontier, on the contrary, economic growth is based rather on "physical" factors (fixed capital, labor force, etc.).

According to A.G. Aganbegyan, in order to ensure sustainable development of the domestic economy, it is necessary to provide an annual increase in the high-tech production sector by about 15% in the coming years (Aganbegyan, 2020). In the modern world, with the global nature of producer competition and a sharp acceleration of the pace of scientific and technological development, it is fundamentally possible to achieve this only in line with the innovation paradigm.

I.M. Golova notes that Russia's transition to an innovation development paradigm is an objective necessity in the context of ensuring sustainable competitive growth. Nevertheless, according to the researcher, Russia is currently lagging significantly behind the technological leaders in terms of innovation activity. Russia ranks 48th (between Romania and India) on the Global Innovation Index. In addition, Russia's share in global high-tech exports decreased to 0.35%. The economy's dependence on imports for such crucial items as machine tools and tools is about 90%, which poses a serious threat to the country's socio-economic security, especially in the face of increasing international sanctions (Golova, 2021).

At present, the transition of the Russian economy to the path of innovation development is limited by a large number of factors, including the consequences of the global crisis, as well as sanctions imposed on Russia by a number of foreign states. These reasons have a negative impact on the innovation activities, as well as provoke negative dynamics of industrial growth rates, slowing down the development of infrastructure industries, which seriously restricts institutional and technological changes in the economy and leads to a greater drop in the competitiveness of Russian industry in world markets, including high-tech ones. For the successful development of the Russian economy in the innovative aspect, it remains important to develop measures aimed at modernizing production, industry, and the development of innovative entrepreneurship, the implementation of which will contribute to changing the technological appearance of the territory of the Russian Federation (Yakushev, 2017; Kuznetsova, 2019).

As a rule, microeconomic units – subjects of innovation activity and organizations of innovation infrastructure – become the immediate local "points" of innovation implementation and the realization of relevant investment projects. These are the enterprises, as well as individual entrepreneurs engaged in industries, agriculture, and services.

The private sector (represented by entrepreneurs) is considered one of the key actors in innovation development in regional socio-economic systems. This is due to the fact that entrepreneurship

is a representative of the "real" sector of the economy, which creates a product and sells it on the market. In the context of the transition of the world's largest economies to innovation development, we would like to focus on the role of innovation entrepreneurship in ensuring economic development in regions. We should note that the idea of R. Nelson (one of the founders of the concept of national innovation systems (NIS)) was that private commercial firms are the "heart" of the national innovation systems of large industrialized countries.

Innovation entrepreneurship is an independent activity carried out by entrepreneurs on a systematic basis; this activity is connected not only with the development of innovations, but also their transfer to the category of innovations (Ivanov, 2021). Among the scientists who have been engaged in and are still studying the impact of innovation entrepreneurship on the development of regional economies, representatives of the Harvard School, the Austrian School, and the Modern Russian School of Innovation can be noted. Also we would like to mention the representatives of the theory of endogenous economic growth (Lucas, 1988; Grossman, Helpman, 1989; Romer, 1990; Rivera-Batiz, Romer, 1991; Romer, 1992; Nelson, Romer, 1996).

Drawing an analogy with innovation development, we can say that the history of innovation entrepreneurship development in Russia also has three stages (the 1990s, 2000s, 2010s). Private innovation organizations in Russia emerged back in the first half of the 1990s during the privatization campaign, when small enterprises started to be formed from sectoral research institutes; these enterprises sought to use their own intellectual potential to maintain "viability" in a new economic situation. Their number was gradually decreasing, which was due to the low demand for innovation and the difficulty of entering the market with new products. Nevertheless, since the late 1990s, new innovation organizations have been emerging; they were created to conduct research and development for large companies. Besides, we should note that in 2009 Federal Law 217[3] was adopted, which allows small innovation enterprises to be formed on the basis of universities. Thus, before the adoption of this federal law, most of the innovation enterprises acted as independent companies. The share of state participation was relatively small (Bauman, 2005).

With the adoption of FZ-217, in the first few years alone (from August 2009 to the end of December 2013), about 2,000 small innovation enterprises (SIEs)[4] were established on the basis of 281 Russian universities. It is worth noting that such firms were created not only on the basis of universities, but also research institutes, as well as other institutions of the Russian Academy of Sciences.

The impact of innovation enterprises on the regional economy is considered in the works (Polunin, 2012; Zhilnikov, 2014). According to L.V. Polunin, there is an urgent need to develop a long-term regional innovation policy. In the economic system undergoing a transformation, innovations should take a completely different key place in creating GRP and ensuring the competitiveness of the region's economy. In the work (Zhilnikov, 2014), an attempt was made to perform a correlation analysis aimed at assessing the significance of the impact of innovation activities of enterprises on the economic development of RF constituent entities. In particular, the author selected indicators that characterize, on the one hand, innovation activity (average level of

[3] On amendments to certain legislative acts of the Russian Federation on the creation of economic companies by budgetary scientific and educational institutions for the purpose of practical application (implementation) of the results of intellectual activity: Federal Law 217-FZ, dated August 2, 2009. Available at: http://www.consultant.ru/document/cons_doc_LAW_90201/

[4] Small innovation enterprises: In the conditions of a "barrier environment". Available at: https://akvobr.ru/problemi_razvitiya_malih_innovacionnih_predpriyatii.html

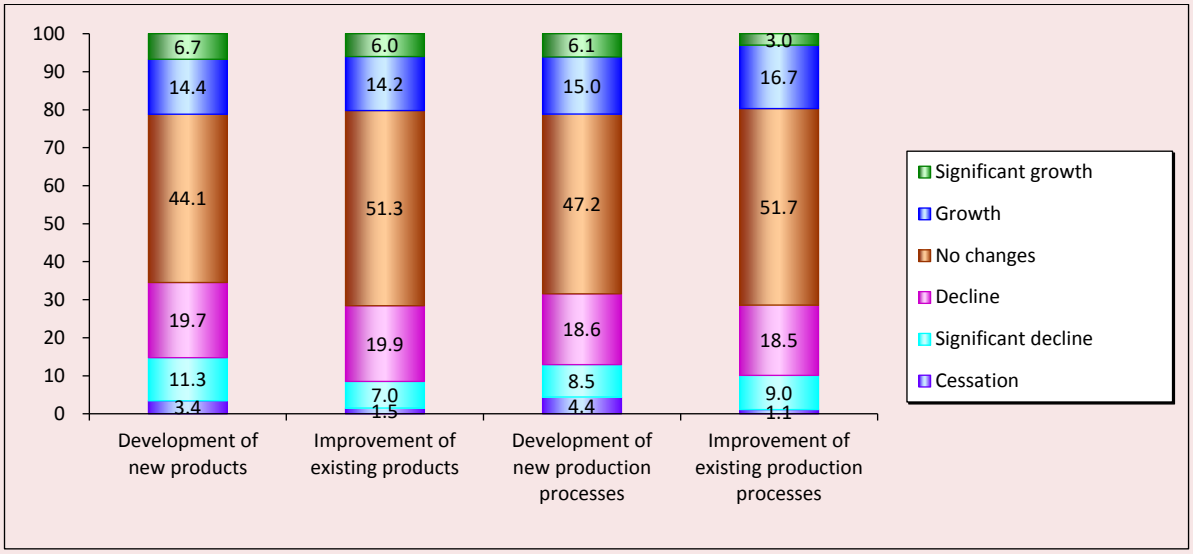
R&D expenditure, average volume of innovative goods, works, services), on the other – economic development of the region (average GRP of the region). The results of multiple correlation analysis allowed the authors to conclude that the innovation activity of enterprises has a significant impact on economic development in the region.

It is worth noting that the role of innovation entrepreneurship has significantly increased during the economic recession observed recently in many countries and caused by various reasons. In particular, this is due to the impact of restrictive measures introduced during the pandemic. In addition, trade wars between countries are actively underway (the United States and countries of Foreign Europe impose economic sanctions against Russia, China, countries of the "Latin American market" (Mexico, Brazil, Argentina)) (Kupriyanov et al., 2020).

Despite all the negative implications of the economic recession, we can firmly state that the current recession creates a favorable "ground" for the development of innovations that are launched through the creative use of existing technologies and competencies. Thanks to non-standard management solutions, many innovation enterprises have profitably integrated into the environment: organizations engaged in the development of robotics have adapted their own technology for medical purposes by introducing it into the process of disinfection of premises. Amazon has launched artificial intelligence technology, which allowed retailers to abandon cash turnover. Diagnostic equipment has also been developed to scan the lungs for virus damage in less than a minute. According to a report of the World Economic Forum, since April 2020, the number of global innovation developments in the field of combating the pandemic has increased threefold (Kupriyanov et al., 2020).

The effects of the COVID-19 pandemic in relation to innovations in a modern high-tech sector were assessed by specialists of the Institute for Statistical Studies and Economics of Knowledge of the National Research University Higher School of Economics (HSE). The analysis was based on the results of a survey of 529 enterprises of high-technology and medium-high-technology industries

Effects of the COVID-19 pandemic: innovation activity (% of the surveyed innovation-active enterprises)



Source: Effects of the COVID-19 pandemic on innovations in the Russian high-tech sector. Website of the HSE Institute for Statistical Studies and Economics of Knowledge. Available at: https://issek.hse.ru/news/473020936.html (accessed: January 21, 2022).

(according to the Eurostat/OECD classification) within the framework of the HSE regular monitoring of innovation activity of enterprises as of end of 2020. The sample is representative by type of economic activity. The results are weighted to reflect the real structure of the Russian economy *(Figure)*.

As we can see in the figure, one fifth (19.5%) of companies took advantage of the crisis to expand their own research and development program. Besides, in 2020, the overall level of innovation activity of organizations in the Russian Federation amounted to 10.8%, which is 1.7 percentage points (p.p.) higher than it was a year earlier (before the onset of the pandemic). The largest growth was demonstrated by such areas as IT (by 10.2% versus 5.5% in 2019), healthcare (8.6% versus 5.3%), software development (13.2% versus 11.1%)[5].

It turns out that the role of innovation enterprises during recession periods is of particular importance, since they are among the first ones to increase their own business activity, which undoubtedly contributes to the "revival" of the economy as a whole. On the one hand, this is due to the fact that innovation enterprises are important actors in scientific and industrial cooperation (Kuznetsova, 2019). In addition, to ensure the stable functioning of innovation companies, firms that are engaged in "servicing" their activities are often involved. For example, these may be firms specializing in the supply of raw materials, equipment repair (including office equipment), outsourcing, etc.

These studies have shown that innovation entrepreneurship can be considered as one of the significant drivers of economic development on the territory. However, it is worth noting that the development of innovation entrepreneurship in the Russian Federation at the present stage tends to slow down. This is evidenced by the negative dynamics of the values of indicators characterizing its effectiveness. In particular, the volume of innovative products has been steadily declining since 2015[6]. Moreover, territorial differentiation in the development of innovation enterprises was noted. This is partly due to the fact that the conditions for conducting innovation activities in the regions vary significantly. As a rule, the concentration of innovation business entities is observed in regions with developed innovation potential, where large scientific and scientific-educational organizations are concentrated, which, in turn, form the basis for innovation business.

Research methodology

In the course of the research, we used theoretical methods (systematization, modeling, generalization) and empirical methods (studying literature, documents and results of activities).

Using the method of systematization, we selected scientific papers that reflect certain aspects of the influence of the innovation factor (including innovation entrepreneurship) on the development of the regional economy; the papers were further studied in detail using the above-mentioned empirical method. Also, systematization helped us to select statistical indicators characterizing both the development of innovation entrepreneurship and the economy of Russian regions.

Since a large amount of analytical and statistical data is provided in the framework of the article, we used the graphical method to make their presentation more clear.

We would like to highlight the method of mathematical modeling, which was also used to build regression models reflecting the relationship between the indicators of development of the regional economy and innovation entrepreneurship. These models were built using Gretl statistical software.

[5] Exacerbation of innovation. The pandemic has intensified the introduction of research and development. Available at: https://www.kommersant.ru/doc/4987473.

[6] Appendix to the collection *Regions of Russia. Socio-Economic Indicators*. Available at: https://rosstat.gov.ru/folder/210/document/47652

Results and discussion

In order to assess the contribution of innovation entrepreneurship in regional economic development, we decided to conduct a regression analysis. This is due to the fact that regression analysis (unlike correlation analysis) allows us not only to establish the presence of a "response" of one variable to another, but also to identify the degree of influence of each regressor on the dependent variable. It is also important to note that within the framework of this work, we tested the methodology of regression analysis of panel data; it was due to the structure of the values of the indicators selected for analysis.

The primary task for the implementation of this analysis is to identify indicators that, on the one hand, reflect certain aspects of innovation entrepreneurship, and on the other hand, the level of economic development of the region.

Since in the framework of regression analysis the dependent variable (region's economic development in our case) should be presented in the singular as the most comprehensive indicator reflecting the level of development of the regional economy, we decided to use the GRP indicator. According to a number of researchers, including (see, for example: Fat'yanov, 2018), it is the GRP indicator that makes it possible to assess the scale and effectiveness of development of regional economies.

Before talking about indicators characterizing the activity of innovation entrepreneurship, we should point out a number of aspects related to the essence of this notion. The approaches to the essence of innovation entrepreneurship that were highlighted in the context of a research conducted at Vologda Research Center of the Russian Academy of Sciences (*technological approach*, according to which the main task of innovation entrepreneurship is to develop novelties; *economic approach,* in which innovation entrepreneurship is considered as an economic entity whose activities are aimed at commercialization of innovations; *comprehensive approach* that combines the provisions of the first two approaches) allow us to determine those statistical indicators that determine the designated type of entrepreneurship most effectively (Ivanov, 2021).

In the framework of this study, we use a comprehensive approach, since it includes both technological and economic components of innovation entrepreneurship thus reflecting the entire multidimensional nature of the concept under consideration.

Conditionally, the indicators that characterize innovation entrepreneurship can be divided into two groups:

1. Indicators characterizing the drivers of innovation entrepreneurship activity:

– the number of organizations that have carried out research and development;

– the share of organizations that implement technological innovations;

– internal R&D costs.

2. Performance indicators of innovation entrepreneurship:

– the volume of innovation goods, works, services;

– developed advanced production technology.

We chose indicators "the number of organizations that have carried out research and development" and "the share of organizations that implement technological innovations" because the specifics of innovation entrepreneurship consists not only in the development of innovative solutions, but also in the creation of an innovative product on their basis; this is reflected in the framework of an integrated approach to defining the essence of the term "innovation entrepreneurship".

The indicator "internal R&D costs" was chosen because it most comprehensively characterizes the costs of innovation activities of enterprises, since it includes not only current costs (for example, employee remuneration, purchase of raw materials to produce innovation goods, etc.), but also capital costs (to purchase equipment, as well), which may indicate the prospects for the development of innovation firms.

The significance of the indicator of the volume of innovation goods, works and services is that it characterizes the effectiveness of innovation entrepreneurship. According to A.A. Rumyantsev, Doctor of Economics, Professor, chief researcher at RAS Institute for Regional Economic Studies, "the volume of innovation goods, works, services in the total volume of goods shipped, works performed, services provided" is an effective indicator of activities to bring research findings to practical use (Rumyantsev, 2018). This opinion is shared by A.A. Abdulvagapova, who considers that "the volume of innovation goods, works and services" is the most important indicator of the effectiveness of small innovation entrepreneurship (Abdulvagapova, 2021).

However, we should note that the abovementioned indicator characterizes the performance effectiveness of organizations engaged in technological innovations to a greater extent. The activity of innovation organizations that conduct R&D is characterized by the indicator "developed advanced production technologies".

The inclusion of only the abovementioned indicators in the regression model will look incorrect, since innovation (including innovation entrepreneurship) is not the only driver of economic development. It would be more correct to consider the impact of innovation entrepreneurship on the regional economy against the background of the main drivers of regional economic growth, corresponding to indicators characterizing the cost of fixed assets, the size of investments in fixed assets, as well as the amount of labor force.

In addition, it is necessary to include an indicator that would most comprehensively characterize the business sector. For this purpose we chose the indicator of turnover of private companies in Russia.

It is worth noting that in a number of statistical collections, including *Innovation Activity Indicators* developed by specialists at the Higher School of Economics[7], one can find a wide range of statistical indicators, including calculated (relative) ones, which characterize certain aspects of activity, as well as the effectiveness of innovation entrepreneurship (for example, "the share of organizations that carried out certain types of innovation activity in the total number of organizations that implemented technological innovations", "the share of costs for certain types of innovation activity in the total amount of costs for technological innovations", "the volume of innovation goods, works, services created with the use of the results of intellectual activity, the rights to which belong to Russian copyright holders", etc.). Nevertheless, these indicators cannot be included in the model, since their values reflect the situation in the Russian Federation as a whole.

It is important to note that the values of the indicators were taken for the period from 2010 to 2019. At that time there was an awareness of the need to build an innovation economy at the state level. In particular, the Skolkovo Foundation was established, an innovation development strategy was developed, etc. (Burkina, 2020). Besides, a study of the statistical population aimed at identifying abnormal behavior (that is, statistical outliers) was conducted. The analysis excluded regions whose values differ several times from the average values in the sample (in particular, Moscow, Saint Petersburg, the Republic of Kalmykia, the Republic of Dagestan, the Jewish Autonomous Oblast).

Moving on to the approximation of the values of the selected indicators we would like to remind that GRP (dependent variable) is a generalizing indicator of regional economic activity that characterizes the process of production of goods and services for end use. Thus, the power approximation corresponding to the Cobb – Douglas production function seems to be the most correct one.

[7] Innovation activity indicators. Available at: https://issek.hse.ru/mirror/pubs/share/397986230.pdf

Table 1. Characteristics of variables for regression analysis

Variable	Unit of measurement	Symbol
Gross regional product*	Million rub.	Y
Cost of fixed assets*	Million rub.	C1
Investments in fixed assets*	Million rub.	C2
Number of workers	Unit	L
Turnover of organizations*	Million rub.	B
Organizations engaged in R&D	Unit	I1
Share of organizations implementing technological innovations	%	I2
Internal R&D costs*	Million rub.	I3
Volume of innovation goods, works, services*	Million rub.	I4
Developed advanced production technology	Unit	I5

* The values of the selected indicators were given in a comparable form (compared to the level of 2019).
Source: Appendix to the collection *Regions of Russia. Socio-Economic Indicators*. Available at: https://rosstat.gov.ru/folder/210/document/47652 (accessed: April 27, 2022).

This function is as follows:

$$Y = A \cdot |Li|^{ai} \cdot |Ci|^{bi}, \quad (1)$$

where A – constant multiplier;

Li – variables corresponding to labor costs as a factor of production;

Ci – variables corresponding to the cost of capital as a factor of production;

ai, bi – elasticity coefficients showing a percentage change in the dependent variable due to a one percent change in the corresponding regressors *(Li, Ci)*.

However, the formula (1) reflects the classical type of production function, where "labor" and "capital" are considered the main factors of production. With the development of economics, factors of economic growth were supplemented with "entrepreneurship" and "innovation".

As part of this work, the production function will take the following form:

$$Y = A \cdot |Li|^{ai} \cdot |Ci|^{bi} \cdot |Bi|^{ci} \cdot |Ii|^{di}, \quad (2)$$

where Bi – variables characterizing the business sector;

Ii – variables characterizing innovation entrepreneurship;

ci, di – elasticity coefficients showing a percentage change in the dependent variable due to a one percent change in the corresponding regressors (*Bi, Ii*).

Thus, we have one dependent variable (let us denote it as "Y") and nine independent variables (*Tab. 1*).

Returning to the question of approximating the values of the presented variables, we note that since the observations were carried out on different grounds for different time periods, the data considered in the context of the analysis were interpreted as panel data. In turn, the panel data analysis technique has a number of advantages over other methods. Thanks to their special structure, panel data help to build more meaningful models and get answers to questions that are not available within models based on spatial (or temporal) data. Moreover, often unobservable factors are correlated with other variables. Within regression models, this means that the unobservable factor is an essential variable in the model and its exclusion leads to biased estimates of the remaining parameters. Panel data models allow for more accurate parameter estimates, even taking into account the presence of multicollinearity between independent variables[8].

A technique for panel data analysis includes three main stages. At the first stage, a pooled model for panel data is being built. The combined model represents a linear regression model that practically does not take into account the panel data structure

[8] Unified model of panel data. Available at: http://www.machinelearning.ru/wiki/index.php?title=%

and does not allow realizing the potential of panel data, including the individual characteristics of the units under consideration.

Next, a fixed effect model is built. This model makes it possible to make a transition in the equation to the time averages. The conditions that are assumed within the framework of the model guarantee the non-bias and consistency of the estimates. This model is quite flexible, because, unlike the previous model, it allows taking into account the individual heterogeneity of objects. However, taking into account flexibility can lead to a loss of significance of estimates (due to an increase in their standard errors).

The final stage is the construction of a random effect model. This model is a compromise between the two previous ones, because it has fewer constraints than the first model, and it helps to get more statistically significant estimates than the second one[9].

Further, based on a number of criteria (including the coefficient of determination, log likelihood, etc.) and statistical tests (a joint test on selected regressors, a robust test, as well as the Hausman and Breusch–Pagan tests), the "best" model is selected.

Let us build models for panel data analysis that are described by the following equation:

$$\ln Y = \ln A + a1 \cdot \ln|C1| + a2 \cdot \ln|C2| + \\ + b \cdot \ln|L| + c \cdot \ln|B| + d1 \cdot \ln|I1| + d2 \cdot \ln|I2| + \\ + d3 \cdot \ln|I3| + d4 \cdot \ln|I4| + d5 \cdot \ln|I5|$$

Table 2. Modeling results

Coefficient values and their significance level	Pooled model	Fixed effect model	Random effect model
const	3.53***	13.67***	6.22***
ln|*C*1|	0.28***	0.01	0.13***
ln|*C*2|	0.25***	-0.01	0.09***
ln|*L*|	0.18***	-0.6**	0.17**
ln|*B*|	0.25***	0.45***	0.40***
ln|*I*1|	0.10**	0.13***	0.14***
ln|*I*2|	0.03**	0.07***	0.06***
ln|*I*3|	-0.03**	0.03	-0.03
ln|*I*4|	-0.03***	-0.01	-0.02**
ln|*I*5|	0.02	0.02**	0.02**
Value of R^2	0.97	0.99	-
Logarithm of likelihood	209.32	576.40	78.59
Results of a joint test on selected regressors (value of p-statistics)	-	5.49265e-23	0.00
Results of a robust test (value of p-statistics)	-	2.55255e-31	-
Results of the Breusch – Pagan test (value of p-statistics)	-	-	6.14028e-95
Results of the Hausmann test (value of p-statistics)	-	-	5.82948e-35

Note:
*** - the variable is statistically significant at the level of 1% or less;
** - the variable is statistically significant at the level of 5%;
* - the variable is statistically significant at the level of 10%.
Own compilation based on the results of regression analysis.

[9] Introduction to panel data analysis. Available at: https://pokrovka11.files.wordpress.com/2011/12/intro_panel.pdf

To do this, we will use Gretl programming environment. We chose this program, because, unlike, for example, Excel environment, Gretl environment allows us to use such an important tool as robust standard errors. This is expressed in the selection of calculation formulas adjusted for heteroscedasticity in the residuals, which significantly increases the accuracy of simulation results. The final values of the estimated coefficients, as well as a number of other indicators characterizing the resulting dependence, are presented in *Table 2*.

The table shows that within the framework of the pooled panel data model, the factor such as the cost of fixed assets of enterprises has the greatest impact on GRP. The second place is occupied by the factors related to investments in fixed assets and the turnover of private companies. The third place is occupied by the number of workers. As for innovation entrepreneurship, its contribution is also noticeable (mainly due to the activities of enterprises engaged in R&D).

According to the fixed effect model, the importance of innovation entrepreneurship for the development of the regional economy is quite high. In particular, in comparison with the previous model, the influence on the resulting variable has increased not only on the part of enterprises engaged in R&D, but also organizations implementing technological innovations (which is of particular importance, since technological innovations are considered as the main result of innovation entrepreneurship). Moreover, in the context of this model, the "return" from the variable characterizing the effectiveness of the technological component of innovation business (that is, from the implementation of R&D) has significantly increased. Nevertheless, the most noticeable effect on the dependent variable in the model with fixed effects is provided by the regressor, which characterizes the business sector (turnover of enterprises). The significance of this regressor (compared to the combined panel data model) has almost doubled. However, we should note that the degree of influence of variables corresponding to indicators characterizing the value of fixed assets, the size of investments in fixed assets, as well as the amount of labor force, has significantly decreased (and has even become negative in some cases). This could be due to the fact that taking into account the individual heterogeneity of objects (which is a characteristic feature of the model with fixed effects) has led to the loss of significance of the data of the variables that characterize them.

As for the random effect model, its results indicate the following: the business sector, as well as the labor factor (the amount of labor force), has the greatest impact on the development of the regional economy. Also, the degree of influence of organizations engaged in R&D is quite high (here it is the highest among all the models presented). In addition, the influence of organizations implementing technological innovations is noticeable. And, finally, the variable characterizing the effectiveness of the technological component of innovation entrepreneurship (developed advanced production technologies) is significant.

Having compared the values of the coefficients of determination (R^2), as well as the values of the logarithms of likelihood, we determined that the fixed effect model is the most "preferable" of the presented models; thus, we should make our choice in favor of this model. Moreover, it is backed by the results of the Hausmann test, the Breusch – Pagan test, the robust test, and the joint test on selected regressors.

However, from our point of view, the results obtained within the framework of this model do not quite objectively reflect the influence of individual regressors on the resulting variable: in particular, taking into account the specifics of the innovation process in modern Russian realities (it is described in more detail in the section "literature review"), it seems doubtful that the significance

of the variables characterizing innovation entrepreneurship is higher than the variables that characterize major drivers of regional economic growth. In our opinion, the results obtained within the framework of the combined panel data model, as well as random effect models, reflect the situation most accurately. Moreover, the values of the coefficients characterizing the drivers of innovation entrepreneurship activity and the effectiveness of such activity are virtually the same in the context of the fixed effect model and the random effect model. Therefore, in this situation, the choice in favor of the random effect model will be more objective.

Comparing the results obtained within the framework of all three models, we can note that the number of organizations engaged in R&D has the greatest impact on GRP (among the factors characterizing innovation entrepreneurship). The influence of organizations implementing technological innovations is 2–3 times less (depending on the model). This can be explained by the fact that in the conditions of the Russian economy, innovation enterprises, for the most part, are engaged in the development of innovation solutions, rather than creating innovation products based on them. The same is evidenced by the values of indicators characterizing the effectiveness of innovation entrepreneurship.

Scientific novelty of the study consists in the transposition of a research technique (regression analysis of panel data) on the subject of research (innovation entrepreneurship), in relation to which this method was previously used "narrowly" (which is due to the lack of completeness in the construction of panel models in the techniques we have studied, and which was solved within the framework of this study). The approbation of the methodology of regression analysis of panel data on the designated subject of research has shown its consistency, which is confirmed by the values of indicators characterizing the quality of the models (even within the framework of the combined panel data model, the value of the determination coefficient was 0.97). And taking into account the fact that the model included indicators that not only characterize innovation entrepreneurship, but also other factors of regional economic development (for example, the business sector without taking into account its "innovation" component), this method can be more widely used in conducting further studies related to assessing the impact of individual drivers of regional economic development.

Practical significance of the study lies in the fact that the results obtained can be used by representatives of regional governments to work out strategies for regional innovation development, including on the basis of innovation entrepreneurship. In particular, the simulation results have shown that with a one percent increase in the number of organizations engaged in R&D the potential growth of GRP in the region can be 0.14%, and with a one-percent increase in the share of organizations implementing technological innovation – by 0.07%. Presidential Decree 204 "On national goals and strategic objectives of the development of the Russian Federation for the period through to 2024", dated May 7, 2018, sets before the RF Government the task to accelerate national technological development and increase the number of organizations implementing technological innovations to 50% of their total number. If the target is achieved by the scheduled date, then the potential growth of GRP only at the expense of organizations implementing technological innovations in the whole country may amount to 3.5%.

We can conclude that our scientific hypothesis has been confirmed: the use of the regression analysis of panel data allowed us to obtain consistent, statistically significant estimates of indicators characterizing innovation entrepreneurship, as well as to produce a comprehensive characterization of the impact of innovation entrepreneurship on the development of the regional

economy (including taking into account the effect of factors that do not directly relate to innovation entrepreneurship, but are still major factors in the development of the regional economy).

Conclusion

Within the framework of the study, we have made a contribution to the development of methodological tools for assessing the impact of innovation entrepreneurship on the development of the regional economy. Unlike other ones, our technique takes into account fixed and random effects, which ensures the completeness of the construction of panel models. The developed technique also allows us to consider the individual heterogeneity of variables. This makes it possible to obtain unbiased estimates.

According to the results of the regression analysis we have assessed the potential contribution of innovation business entities to the development of the regional economy: a one-percent increase in organizations engaged in R&D can potentially ensure the growth of GRP in the region by 0.14%, and a one-percent increase in organizations implementing technological innovations – by 0.07%. Moreover, we have found that in the conditions of the Russian economy, the technological component of innovation entrepreneurship is the most pronounced one (which is confirmed by the results of simulation).

The obtained results can be used for analytical and forecast studies devoted to the analysis of the impact of innovation factors (including innovation entrepreneurship) on the regional economy. In addition, they can be useful to representatives of regional authorities in the development of regional strategies for innovation and scientific and technological development. This will improve the quality of the implemented innovation policy in the Russian regions.

At the subsequent stages of the study we plan to do the following: 1) identify problems and prospects for the development of innovation entrepreneurship in the regions (using methods of sociological research, including questionnaires, expert interviews, case-study); 2) work out a comprehensive mechanism for the development of the economy of Russian regions based on innovation entrepreneurship.

References

Abalkin L.I. (2004). *Strategicheskii otvet Rossii na vyzovy novogo veka* [Russia's Strategic Response to the Challenges of the New Century]. Moscow: Ekzamen.

Abdulvagapova A.A. (2021). Development of the system of state support for small innovation entrepreneurship in the region. *Voprosy regional'noi ekonomiki*, 2(47), 3–10 (in Russian).

Aganbegyan A.G., Klepach A.N., Porfir'ev B.N., Uzyakov M.N., Shirov A.A. (2020). Post-pandemic recovery of the Russian economy and transition to sustainable socio-economic development. *Problemy prognozirovaniya=Studies on Russian Economic Development,* 6, 18–26. DOI: doi.org/10.47711/0868–6351–183–18–26 (in Russian).

Bauman S.N. (2005). Small innovation enterprises of Russia: An inside look (results of a questionnaire study of small innovation enterprises of the Russian Federation). In: *Nauchnye trudy: Institut narodnokhozyaistvennogo prognozirovaniya RAN* [Scientific Articles – Institute of Economic Forecasting Russian Academy of Sciences]. Vol. 3. Pp. 170–175 (in Russian).

Bessy Ch., Favereau O. (2010). Economics of conventions and institutionalism: The outcomes of interaction. *Voprosy ekonomiki,* 9, 26–40 (in Russian).

Burkina T.A. (2020). Scientific and industrial cooperation in innovation sphere. *Vestnik evraziiskoi nauki= The Eurasian Scientific Journal,* 12(6), 1–9 (in Russian).

Caballero G., Soto-Oñate D. (2015). Citation: The diversity and rapprochement of theories of institutional change: original institutionalism and new institutional economics. *Journal of Economic Issues*, XLIX, 4, 947–977. DOI 10.1080/00213624.2015.1105021

Chelnokova O.Yu., Sumarokova E.S. (2014). The influence of the university of small innovative enterprises on regional development. *Izvestiya Saratovskogo universiteta. Novaya seriya. Seriya: Ekonomika. Upravlenie. Pravo=Izvestiya of Saratov University. New Series. Series: Economics. Management. Law,* 14(2-2), 368–373 (in Russian).

Cwik P.F. (2011). Citation: The new neo mercantilism: Currency manipulation as a form of protectionism. *Economic Affairs*, 31(3), 7–11.

Dequech D. (2012). Citation: Post Keynesianism, heterodoxy and mainstream economics. *Review of Political Economy*, 24(2), 353–368.

Fat'yanov A.A. (2018). GRP as an indicator of the state of the economy of the region. *Azimut nauchnykh issledovanii: ekonomika i upravlenie,* 7(1)(22), 254–256 (in Russian).

Fenin K.V. (2017). New interpretation of the classical interregional and international trade theories: Economic logic vs the economy. *Izvestiya Saratovskogo universiteta. Novaya seriya. Seriya: Ekonomika. Upravlenie. Pravo=Izvestiya of Saratov University. New Series. Series: Economics. Management. Law,* 17(2), 148–156 (in Russian).

Gadzhiev Yu.A. (2017). Early theories of economic growth: from mercantilism to the classical school. *Sciences of Europe,* 16–2(16), 16–23 (in Russian).

Glazyev S.Yu. (2008). Will the transition of the Russian economy to an innovative path of development take place? *Rossiiskii ekonomicheskii zhurnal,* 1-2, 3–11 (in Russian).

Glazyev S.Yu. (2011). Alternative government policy of modernization and national economy development (suggestions of scientists from economics section of RAS social sciences branch). *Rossiiskii ekonomicheskii zhurnal,* 4, 68–85 (in Russian).

Glazyev S.Yu. (2013a). On the unevenness of modern economic growth as a process of development and change of technological patterns. *Sotsiologiya,* 4, 42–52 (in Russian).

Glazyev S.Yu. (2013b). The policy of outrunning development under the change of technological order. *Vestnik RAEN=Bulletin of Russian Academy of Natural Sciences,*13(1), 29–35 (in Russian).

Golova I.M. (2021). Ecosystem approach to innovation management in russian regions. *Ekonomika regiona=Economy of Region,* 17(4), 1346–1360 (in Russian).

Gretchenko A.A., Manakhov S.V. (2011). Innovation in Russia: History, modern time and prospects. *Kreativnaya ekonomika=Creative Economy,* 3, 76–83 (in Russian).

Grossman G.M., Helpman E. (1989). Citation: Product development and international trade. *The Journal of Political Economy*, 97(6), 1261–1283.

Gutman G.V. (2002). *Upravlenie regional'noi ekonomikoi* [Managing Regional Economy]. Moscow: Finansy i statistika.

Hospers G.-J. (2005). Citation: Joseph Schumpeter and his legacy in innovation studies. *Knowledge, Technology, & Policy*, 18(3), 20–37.

Ivanov S.L. (2021). Analysis of the essence and state of innovative entrepreneurship in the conditions of the modern Russian economy. *Aktual'nye problemy ekonomiki i menedzhmenta=Actual Problems of Economics and Management*, 4(32), 77–91 (in Russian).

Kovaleva I.P. (2015). Models of economic growth: Theory and practice of Keynesianism. *Aktual'nye voprosy ekonomicheskikh nauk,* 45, 6–14 (in Russian).

Kupriyanov A.N., Kholodova P.K., Ostrikova O.I. (2020). Development of the innovative entrepreneurship sector in the conditions of economic recession. In: *Upravlenie v usloviyakh ekonomicheskogo krizisa: strategiya protivodeistviya ugrozam i perspektivy ustoichivogo razvitiya. Materialy XVI Mezhdunarodnoi nauchno-prakticheskoi konferentsii* [Management in the Context of the Economic Crisis: Strategy of Countering Threats and the Prospects for Sustainable Development. Proceedings of the 16th International Research-to-Practice Conference] (In Russian).

Kurz H.D. (2007). Innovation and profit. Schumpeter and the heritage of the classics. *Finansy i biznes,* 2, 26–47 (in Russian).

Kuznetsova E.P. (2019). Systematization of directions of government programs on stimulation of research and production cooperation in NWFD. *Sotsial'noe prostranstvo=Social Area,* 4(21), 1–7. DOI: 10.15838/sa.2019.4.21.9 (in Russian).

Leksin V.N., Shvetsov A.N. (1997). *Gosudarstvo i regiony. Teoriya i praktika gosudarstvennogo regulirovaniya territorial'nogo razvitiya* [The State and the Regions. Theory and Practice of State Regulation of Territorial Development]. Moscow: URSS.

Leont'ev B. (2015). Systemic innovation economy. *Intellektual'naya sobstvennost'. Promyshlennaya sobstvennost',* 9, 4–14 (in Russian).

Lucas R.E. (1988). Citation: On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3–42.

Nelson R.R., Romer P.M. (1996). Citation: Science, economic growth, and public policy. *Challenge*, 39, 9–21.

Oliveira S.R.M. (2019). Relationship between technological eco-innovation capacity and innovation performance: Evidence from most innovative firms in the USA. In: *Proceedings of the International Management Conference*, *Faculty of Management, Academy of Economic Studies, Bucharest, Romania*. 13(1). November.

Oswald O.R.S. (2019). The new architects: Brazil, China, and innovation in multilateral development lending. *Public Administration and Development*, 39(4–5), 203–214.

Polunin L.V. (2012). The impact of innovative enterprises on the regional economy. *Sotsial'no-ekonomicheskie yavleniya i protsessy=Social-Economic Phenomena and Processes*, 7-8(41-42), 133–139 (in Russian).

Polyanskaya N.M., Naidanova E.B. (2015). Role of innovations in the economy of Russia and its regions. *Naukovedenie,* 7(4). Available at: http://naukovedenie.ru/PDF/129EVN415.pdf. DOI: 10.15862/129EVN415 (in Russian).

Ramadani V., Hisrich R.D., Abazi-Alili H., Dana L., Panthi L. Abazi-Bexheti L. (2019). Product innovation and firm performance in transition economies: A multi-stage estimation approach. *Technological Forecasting and Social Change*, 140, 271–280. DOI: 10.1016/j.techfore.2018.12.010

Rivera-Batiz L.A., Romer P.M. (1991). Citation: Economic integration and endogenous growth. *The Quarterly Journal of Economics*, 106, 531–555.

Romer P.M. (1990). Citation: Endogenous technological change. *The Journal of Political Economy*, 98(5), 71–102.

Romer P.M. (1992). Citation: Two strategies for economic development: Using ideas and producing ideas. *The World Bank Economic Review*, 6, 63–91.

Ruban D.A. (2016). Regional innovation systems in Russia: A social and economic aspect. *Regional'naya ekonomika: teoriya i praktika=Regional Economics: Theory and Practice,* 8(431), 114–129 (in Russian).

Rumyantsev A.A. (2018). Research and innovation activity in the region as a driver of its sustainable economic development. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 11(2), 84–99. DOI: 10.15838/esc.2018.2.56.6 (in Russian).

Salamova A.S. (2020). The theoretical foundations of institutionalism. Application in modern economics. *Aktual'nye voprosy sovremennoi ekonomiki=Topical Issues of the Modern Economy*, 10, 323–329 (in Russian).

Schumacher R. (2012a). Citation: Adam Smith's theory of absolute advantage and the use of doxography in the history of economics. *Erasmus Journal for Philosophy and Economics*, 5, 54–80.

Schumacher R. (2012b). Citation: Deconstructing the theory of comparative advantage. *World Economic Review*, 2, 83–105.

Simachev Yu.V., Kuzyk M.G., Fedyunina A.A., Zaitsev A.A., Yurevich M.A. (2021). Labor productivity in the non-resource sectors of the Russian economy: What determines firm-level growth? *Voprosy ekonomiki,* 3, 31–67 (in Russian).

Smotritskaya I.I., Chernykh S.I. (2021). Organizational innovations in the sphere of public administration. *Vestnik Instituta ekonomiki rossiiskoi akademii nauk=Bulletin of the Institute of Economics of the Russian Academy of Sciences,* 1, 9–25 (in Russian).

Toffler A. (1986). The future of labor. In: *Novaya tekhnokraticheskaya volna na Zapade* [A New Technocratic Wave in the West]. Moscow: Progress (in Russian).

Uskova T.V. (2009). *Upravlenie ustoichivym razvitiem regiona* [Managing Sustainable Development in the Region]. Vologda: ISERT RAN.

Yakushev N.O. (2017). High-technology export of Russia and its territorial aspects. *Problemy razvitiya territorii=Problems of Territory's Development*, 3(89), 62–77 (in Russian).

Zadumkin K.A., Terebova S.V. (2009). The Vologda Oblast: Prerequisites for innovation development. *Ekonomicheskie i sotsial'nye peremeny v regione: fakty, tendentsii, prognoz,* 1(45), 26–40 (in Russian).

Zhil'nikov A.Yu. (2014). Analysis of the impact of innovative activity of the region on GRP. *Territoriya nauki,* 6, 53–57 (in Russian).

Information about the Authors

Semen L. Ivanov – Junior Researcher, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: slivanov2020@mail.ru)

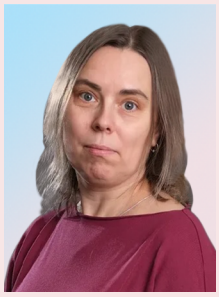
Aleksandr I. Metlyakhin – Candidate of Sciences (Economics), Associate Professor, Vologda State University (15, Lenin Street, Vologda, 160000, Russian Federation; e-mail: metlyahin.ai@yandex.ru)

Received March 10, 2022.

DOI: 10.15838/esc.2022.4.82.10
UDC 332.14, LBC 65.26

Scenario Modeling and Forecast of the Degree of Depreciation of Fixed Assets at Manufacturing Enterprises in Russia's Regions

Ilya V.
NAUMOV
Institute of Economics of the Ural Branch of the Russian Academy of Sciences
Yekaterinburg, Russian Federation
e-mail: ilia_naumov@list.ru
ORCID: 0000-0002-2464-6266; ResearcherID: U-7808-2017



Natalya L.
NIKULINA
Institute of Economics of the Ural Branch of the Russian Academy of Sciences
Yekaterinburg, Russian Federation
e-mail: nikulinanl@mail.ru
ORCID: 0000-0002-6882-3172; ResearcherID: J-9846-2013

Abstract. In a deteriorating geopolitical situation and under the pressure of sanctions on the Russian economy, its manufacturing enterprises are facing significant restrictions in the import of high-tech equipment and materials necessary for technical re-equipment and modernization of the fixed assets they use. These restrictions contribute to increasing the degree of their deterioration and will do so in the future as well. The hypothesis of our study consists in the assumption that the dynamics of fixed assets depreciation at enterprises is influenced not only by the volume of attracted investments, but also by other factors, and that the degree of their impact in different groups of regions is differentiated. The aim of the work is to design forecast scenarios that would show the changes in the degree of fixed assets depreciation at manufacturing enterprises, taking into account the differentiated influence of factors. The study presents a methodological approach based on statistical and regression analysis using panel data

For citation: Naumov I.V., Nikulina N.L. (2022). Scenario modeling and forecast of the degree of depreciation of fixed assets at manufacturing enterprises in Russia's regions. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 155–171. DOI: 10.15838/esc.2022.4.82.10

and autoregressive integrated moving average (ARIMA) model to identify factors affecting the dynamics of fixed assets depreciation at manufacturing enterprises in various regions and design a system of forecast scenarios for its changes in the future. We group the regions according to the degree of depreciation of fixed assets of manufacturing enterprises (we identify groups of regions with an extremely high level of fixed assets depreciation, and the levels above and below the Russian average). Using regression models we identify the differentiated influence of factors on the dynamics of fixed assets depreciation: in the first and third groups of regions, the key factor in increasing depreciation is the difficult financial situation of enterprises; in the second group – insufficient volume of attracted investments in fixed assets. For each group of regions, autoregressive modeling of the dynamics of these factors is carried out using a moving average to form the most likely forecast scenarios for changes in the degree of fixed assets depreciation at manufacturing enterprises until 2024. As a result of forecasting, we identify regions with the most likely dynamics of further increase in the degree of depreciation of fixed assets of enterprises; these regions should become a priority in obtaining state support for the implementation of industrial policy in Russia.

Key words: depreciation of fixed assets, manufacturing industry, scenario modeling, forecasting, regression analysis, ARIMA modeling, Russia's regions.

Acknowledgment

The article was prepared in accordance with the research plan for the laboratory for modeling spatial development of territories at the Institute of Economics of the Ural Branch of the Russian Academy of Sciences for 2022.

Introduction

The state of fixed assets of industrial enterprises in Russia's regions has approached a critical level. The depreciation degree of fixed assets of manufacturing production in the Russian Federation at the end of 2020 was 51.9%, and the share of fully worn out fixed assets in the total volume of fixed assets was 20.3%. S.D. Bodrunov noted: "Over the previous 25 years, both the commissioning of new fixed assets and the disposal of especially outdated, worn-out funds have been happening at a completely insufficient pace. The whole period is characterized by a low level of investment in the renewal of fixed capital, which stems from the overall low level of gross accumulation in the economy"[1]. In the studies of E.A. Panova[2], E.V. Lyadova (Lyadova, 2017), L.I. Lugacheva (Lugacheva, 2001), D.V. Rozov[3], E.V. Vylegzhanina, V.A. Roslyakov (Vylegzhanina, Roslyakov, 2018), N. Karlova, E. Puzanova, I. Bogacheva (Karlova et al., 2019), E.K. Prokhorova (Prokhorova, 2019), M.A. Pechenskaya (Pechenskaya, 2020) and others, the researchers focus on the need to update fixed assets of industrial production, since "the worn-out state of fixed assets and technological lag do not allow enterprises to produce new types of technological products and make the equipment

[1] Speech by S.D. Bodrunov, Director of the Institute of New Industrial Development named after S.Yu. Vitte, President of the Free Economic Society of Russia (Source: Labor productivity in Russia and in the world. Impact on the economic competitiveness and living standards (2016). *Analiticheskii vestnik*, 29(628). Moscow, 8–14.

[2] Panova E.A. (2016). Sustainable financing of reproduction of fixed assets of industrial enterprises: Candidate of Sciences (Economics), dissertation. Moscow.

[3] Rozov D.V. (2011). Efficiency of renewal of fixed capital in an innovative economy: Doctor of Sciences (Economics), dissertation abstract. Moscow.

of enterprises less competitive"[4]. Studies of F. Freiberg and P. Scholz have shown that investments in modern production equipment provide cost savings, reduced production cycle time, balanced use of equipment capacity and improved product quality (Freiberg, Scholz, 2015). Also, the work of R. Boucekkine and B. de Oliveira Cruz considered the relationship between the technological renewal of fixed assets and investments (Boucekkine, Oliveira Cruz, 2015).

The renewal of worn-out, outdated production assets requires financial state support and active attraction of investments in fixed assets of other institutional sectors. In order to identify regional priorities for attracting investments in the renewal of enterprises' fixed assets, it is necessary to assess the factors influencing their depreciation degree and to form forecast scenarios for its further change, which is the purpose of our work. In the course of the study, we have set the following tasks: to assess the depreciation degree of fixed assets of manufacturing enterprises in Russia's regions; to determine the factors influencing the depreciation degree of enterprises' fixed assets in the selected groups of regions; to conduct ARIMA modeling of the dynamics of established factors; to form forecast scenarios for the dynamics of depreciation of enterprises' fixed assets taking into account the identified factors; to determine the regions in need of priority state support within the framework of the industrial policy implemented in Russia for the renewal of worn-out funds.

Theoretical review of studies on the assessment of the impact of factors on the depreciation of fixed assets of industrial enterprises

Theoretical review of works in the field of assessing factors, influencing the depreciation degree of enterprises' fixed assets in various territorial systems, shows that researchers mainly use statistical data analysis methods (relative indicators, averages and dynamics indicators) and regression modeling methods. For instance, G.Y. Gagarina and L.S. Arkhipova have used statistical methods. As a result of the research, the authors found that the main factors for the renewal and modernization of the production potential of enterprises are "investments in fixed assets, innovation and improvement of the labor capital quality" (Gagarina, Arkhipova, 2017). M.S. Saprykina used statistical methods to analyze and predict the depreciation dynamics of enterprises' fixed assets in the electricity production and distribution industry (Saprykina, 2020), E.S. Dzhevitskaya used them to assess the state of fixed assets of enterprises and required investments in their renewal (Dzhevitskaya, 2017), and T.Yu. Kovaleva – for the study of the state of fixed assets of the Russian economy and the effectiveness of management decisions taken by central and regional authorities in the investment sphere (Kovaleva, 2010).

L.I. Rozanova and S.V. Tishkov used the methods of horizontal and vertical analysis, detailing, grouping, comparison and synthesis, as well as graphical analysis to assess the relationship between the depreciation degree of fixed assets and the industrial applicability of innovations. The authors have concluded that "a large-scale modernization of funds is required to realize the innovative potential" (Rozanova, Tishkov, 2018).

T.V. Ogorodnikova and co-authors used the methods of correlation and regression analysis of factors influencing the depreciation degree of fixed assets to estimate the relationship of depreciation of fixed assets with a technical accelerator and an integral indicator of their physical wear (Ogorodnikova et al., 2020), E.A. Panova used them to substantiate the impact of investments in

[4] Strategy for the development of the machine tool industry until 2030. Available at: https://minpromtorg.gov.ru/common/upload/docs/strategy/project.pdf (accessed: May 7, 2022).

fixed assets on the reproduction of fixed assets of industrial enterprises[5]. In the course of econometric modeling, E.Y. Nazrullaeva confirmed the important role of investments in the technological renewal of funds[6]. As factors V.S. Barashkov considered not only investments in fixed assets, but also the share of technological costs per 1 ruble of innovative products[7]. L.H. Dikaeva analyzed the reasons for the decline in the dynamics of industrial production in the North Caucasian Federal District revealing the dependence of the renewal of fixed assets in industry on the investment volume[8].

The works of M.A. Kondenkova studies the relationship between depreciation of fixed assets and the investment volumes (Kondenkova, 2017); the work of N.P. Goridko and R.M. Nizhegorodtsev – the impact of depreciation of fixed assets on the growth of inflationary processes in the economy (Goridko, Nizhegorodtsev, 2011).

Y. Kolesnik, O. Dobrovolska, I. Malyuta, A. Petrova and S. Shulyak searched for internal sources of financing for the reproduction of fixed assets of agricultural enterprises. Correlation and regression analysis allowed the authors to confirm the close relationship between the depreciation return index for effective repair of fixed assets and the investment volumes (Kolesnik et al., 2019).

E.N. Chizhova and G.G. Balabanova investigated the causes of labor productivity decline in the construction materials industry. They established the relationship between equipment wear and labor productivity growth rates (Chizhova, Balabanova, 2017).

With the help of the least squares method, D. Postigillo García, A. Blasco, J. Ribal determined the necessary depreciation rate of enterprises' fixed assets depending on the period of their use using linear, exponential and power-law regression models (Postigillo García et al., 2017). The works of F.G. Alzhanova, N.K. Nurlanova and F.M. Dnisheva (Alzhanova et al., 2020), T. Franik (Franik 2007,), Lazebnik L. (Lazebnik, 2018), L. Tan, M. Hao, Ya. Zhang (Tang et al., 2013), S.N. Abieva, A.M. Kanabekova (Abieva, Kanabekova, 2021), S. Collings (Collings, 2016), S. Urban, A.S. Kowalska (Urban, Kowalska, 2015) also carried out the study of the relationship between investments and depreciation of fixed assets.

During the theoretical review of the works, we have revealed that the authors most often considered the volume of attracted investments in fixed assets as a factor influencing the depreciation of fixed assets of industrial enterprises. Our study assumes an assessment of the impact on the dynamics of depreciation of fixed assets and other factors.

Methodological approach to scenario modeling and forecasting of the depreciation degree of fixed assets of manufacturing enterprises in Russia's regions

A theoretical research review in the field of assessing and forecasting the depreciation degree of fixed assets in the manufacturing industry has shown the need to develop an approach that uses statistical and regression analysis, ARIMA modeling methods in a complex to identify factors that affect the dynamics of depreciation of fixed assets in various territorial systems, and design a system of forecast scenarios for its changes in the future. Methods of statistical analysis, such as the average value and the standard deviation, at the initial stage of the study will help to identify the regions for which the problem of depreciation of fixed assets of

[5] Panova E.A. (2016). Sustainable financing of reproduction of fixed assets of industrial enterprises: Candidate of Sciences (Economics), dissertation. Moscow.

[6] Nazrullaeva E.Yu. (2010). Modeling the impact of investments in fixed assets on material costs in Russian industries: Candidate of Sciences (Economics), dissertation abstract. Moscow.

[7] Barakov V.S. (2014). Modernization of the economy of Russian regions: Factors, evaluation and monitoring of results: Candidate of Sciences (Economics), dissertation abstract. Volgograd.

[8] Dikaeva L.Kh. (2011). Socio-economic development of the macroregion: Modernization of the economic complex (case study of the North Caucasian Federal District): Candidate of Sciences (Economics), dissertation abstract. Rostov-on-Don.

industrial enterprises is most acute. To identify such regions, we propose to calculate the upper limit of the spread of the depreciation degree of fixed assets relative to the average level (1):

$$V_{max} = \overline{V_i} + \sqrt{\frac{\sum(V_i - \overline{V_i})^2}{n}}, \quad (1)$$

where V_{max} – the upper limit of the spread of the depreciation degree of fixed assets in manufacturing (at the end of 2020), %; V_i – the depreciation degree of fixed assets of manufacturing enterprises (at the end of 2020), %; $\overline{V_i}$ – average Russian level of depreciation of fixed assets of manufacturing enterprises (at the end of 2020), %.

Regions where the depreciation degree of fixed assets of manufacturing enterprises at the end of the year exceeds the limit ($V_i > V_{max}$), will be classified as territories with an extremely high level of their deterioration. To confirm the correctness of the regions' assignment to this group, we also propose an assessment of the complete depreciation of funds – the calculation of the proportion of fully worn-out fixed assets at the full accounting value in manufacturing. This indicator in the regions of the first group should also significantly exceed the average Russian level. Statistical indicators will also be used to search for regions with a high depreciation level of fixed assets of enterprises ($V_i \geq \overline{V_i}$), exceeding the average Russian level, as well as regions with depreciation of fixed assets below the average level ($V_i < \overline{V_i}$), for which the tasks of modernization of fixed assets are not as acute as in the regions the first and second groups.

At the next stage of the study, within the framework of the selected groups of regions, we propose to build regression models using panel data to assess the impact of factors on the dynamics of depreciation of fixed assets of manufacturing enterprises: models with fixed and random effects, using the combined least squares method and adjusted for heteroscedasticity. The construction of regression models within the selected groups will be carried out due to the high differentiation in the depreciation degree of fixed assets in different regions. This will make it possible to increase the uniformity of the distribution of data used for modeling, and to obtain more reliable models with robust estimates that are resistant to various kinds of outliers and interference.

The main factors in the models will be the investment volume in fixed assets by type of activity "Manufacturing", the net financial result of enterprises for this activity type, the share of unprofitable manufacturing enterprises from the total number of organizations of this activity type and the number of advanced production technologies used. To build regression models, we plan to use the available statistical data of the Federal State Statistics Service for 85 Russia's regions from 2011 to 2020. To select the optimal model, we will carry out a panel analysis using the Durbin – Wu – Hausman test and the Schwarz, Akaike and Hannan – Quinn information criteria; we will evaluate the reliability of the main parameters of the model using standard errors and *P*-values, to check for structural shifts in the sample of observations we will use the Chow test. We suppose to evaluate the reliability of the model using the coefficient of determination and the probability of fulfilling the null hypothesis of its insignificance (*F*-value). We will pay special attention to the assessment of the presence of heteroscedasticity in the model (using the White test), autocorrelation between residuals (using Wooldridge and Durbin – Watson test), as well as the normality of the distribution of model errors. The constructed models will allow determining the factors that have a significant impact on the dynamics of depreciation of fixed assets of manufacturing enterprises in various groups of regions, and in the future, building medium-term forecast scenarios for its changes.

To form the most likely forecast scenarios for changes in the depreciation degree of fixed assets of industrial enterprises in Russia's regions until 2024,

we assume *ARIMA* modeling and forecasting of the dynamics of key factors, the influence of which was established at the previous stage of the study. We propose to use the forecast values of the dynamics of changes in factors calculated as a result of *ARIMA* modeling, which preserve the noted past trends in the future, as well as extremely possible forecast values, at the next stage to form three forecast scenarios for changes in the dynamics of depreciation of fixed assets of manufacturing enterprises in the regions: inertial, assuming the preservation in the future of the trend of depreciation of funds noted over the previous 10 years, pessimistic and optimistic. The constructed forecast scenarios will help to determine the regions in which, under the influence of established factors, it is possible to further actively increase the worn-out fixed assets of manufacturing enterprises, as well as the regions in which this problem will be solved, and the proportion of worn-out fixed assets will decrease. The presented methodological approach to scenario modeling and forecasting the dynamics of depreciation of fixed assets will make it possible to determine the spatial priorities of solving the problem of updating fixed assets of manufacturing enterprises, which are so necessary for the implementation of industrial policy in Russia's regions.

Research results

In order to correctly assess the depreciation of fixed assets of manufacturing enterprises in Russia's regions and to study the factors influencing its dynamics, we have carried out a grouping of regions (*Tab. 1*).

The first group of regions included territories with an extremely high depreciation level of enterprises' fixed assets exceeding one standard deviation from the average Russian level (with the depreciation degree of funds of more than 60% and a specific weight of fully worn-out funds of more than 25%). Among the regions of this group, enterprises of the Komi Republic had the highest depreciation degree of fixed assets (78.2%). More than 50% of all fixed assets of enterprises in this region at the end of 2020 were completely worn out. In Sevastopol, the share of fully worn-out funds of manufacturing enterprises was 45.2%. Regions such as Astrakhan, Samara, Kostroma, Ryazan, Yaroslavl and Tambov oblasts, the Republic of Khakassia, Khanty-Mansi, Yamalo-Nenets and Chukotka autonomous okrugs were also distinguished by a high depreciation level of enterprise funds. The average depreciation level of fixed assets of enterprises in the regions of this group was 65.3%, and the average proportion of fully worn-out funds was 32.7%.

In the regions of the second group, the depreciation degree of fixed assets of manufacturing enterprises was lower than in the first group, but exceeded the national average of 51.9%. The proportion of fully worn-out enterprise funds in most regions of the second group was also higher than the national average of 19.3% (see Tab. 1). The highest proportion of fully worn-out enterprise funds at the end of 2020 was observed in the Republic of Bashkortostan, the Jewish Autonomous Oblast, Nenets Autonomous Okrug, the Chelyabinsk, Pskov, Nizhny Novgorod, Saratov and Vologda oblasts. The average depreciation level of enterprises' fixed assets in the regions of this group was lower than in the regions of the first group (54.8%), and the average proportion of fully worn-out funds was almost two times lower (19.8%).

The third group includes regions with the depreciation level of manufacturing enterprises below the average Russian level. At the same time, regions with a high proportion of completely worn-out funds were allocated in this group. So, in the Ivanovo Oblast, 24.6% of fixed assets were considered completely worn-out by manufacturing enterprises, in the Perm Oblast – 21.6%, the Smolensk Oblast – 22.2%, the Kurgan Oblast – 21.6%, the Tyumen Oblast – 21.1%, the Republic of Buryatia – 21%. In other regions of this group, the proportion of fully worn-out funds did not exceed 19%.

Table1. Depreciation degree of fixed assets of manufacturing enterprises in Russia's regions and share of fully worn-out funds at the end of 2020, %

Region	Depreciation degree of funds	Proportion of fully worn-out funds	Region	Depreciation degree of funds	Proportion of fully worn-out funds
First group of regions (with extremely high level of depreciation of fixed assets of enterprises)			**Second group of regions** (with the level of depreciation of fixed assets of enterprises above the average in Russia)		
Komi Republic	78.2	53.3	Jewish AO	59.7	23.6
Astrakhan Oblast	67.6	30.3	Saint Petersburg	57.5	20.9
Sevastopol	67.6	45.2	Republic of North Ossetia	57.2	16.1
Republic of Khakassia	66.6	30.7	Republic of Bashkortostan	57.1	26.0
Samara Oblast	65.4	32.4	Chelyabinsk Oblast	56.9	24.2
Chukotka AO	64.0	23.0	Kaliningrad Oblast	56.5	18,8
Khanty-Mansi AO	63.2	30.8	Saratov Oblast	56.4	23.1
Kostroma Oblast	63.1	27.6	Nizhny Novgorod Oblast	56.3	23.2
Yamalo-Nenets AO	62.6	32.9	Volgograd Oblast	56.3	20.7
Ryazan Oblast	62.4	29.3	Republic of Kalmykia	56.1	13.8
Yaroslavl Oblast	62.4	31.4	Tomsk Oblast	55.8	19.2
Tambov Oblast	60.5	25.5	Vologda Oblast	55.5	23.2
Third group of regions with the depreciation level of fixed assets of manufacturing enterprises below the average in Russia (other regions)			Mari El Republic	55.1	18.0
			Belgorod Oblast	54.9	19.0
			Khabarovsk Krai	54.7	18.9
			Tver Oblast	54.6	20.0
			Altai Oblast	54.4	20.2
			Republic of Adygea	54.4	19.3
			Novosibirsk Oblast	54.3	20.2
			Moscow Oblast	54.3	16.4
			Republic of Mordova	53.9	16.1
			Chuvash Republic	53.9	22.1
			Lipetsk Oblast	53.9	19.4
			Irkutsk Oblast	53.7	20.7
			Pskov Oblast	53.1	23.5
			Nenets AO	52.9	25.3
			Vladimir Oblast	52.7	16.4
			Rostov Oblast	52.3	20.5
			Republic of Dagestan	52.1	7.8
			Karachay-Cherkess Republic	52.1	22.3
			Ulyanovsk Oblast	51.8	19.5
			Omsk Oblast	51.8	16.4
Note: own calculation according to the Federal State Statistics Service data.					

To search for factors that have a significant impact on the dynamics of depreciation of enterprises' fixed assets in the manufacturing industry in the considered groups of regions, we have carried out a regression analysis using panel data. We have used 120 observations when constructing regression models for the first group of regions (for 12 regions for the period from 2011 to 2020). After removing factors with regression coefficients insignificant in *P*-value and standard errors, a regression model with fixed effects was recognized as optimal:

$$Y = e^{1.824} \times X^{0.619}, \quad (2)$$

where Y – depreciation degree of fixed assets of manufacturing enterprises (at the end of the year), %; $e^{1.824}$ – constant in the regression model; X – share of unprofitable enterprises by type of activity "Manufacturing", % of the total number of organizations.

Table 2 presents the main parameters of this model and the results of assessing their statistical significance.

Parameters of the regression model with fixed effects are statistically significant, the correlation relationship between the variables is close ($R = 0.78$), about 61% of the data variance is explicable by the constructed model. There is homoscedasticity in the model, that is, the constancy of the variance in the observations is fixed, in addition, the model errors obey the law of normal distribution, there is no autocorrelation between the residuals, as evidenced by the Durbin–Watson statistics ($1.5 < DW < 2.5$) and the Wooldridge test. The Durbin – Wu – Hausman test showed that a model with random effects better explains the relationship between variables, but based on the lowest values of the Schwarz, Akaike and Hannan – Quinn information criteria, we selected a model with fixed effects, in which the P-significance of Hausman statistics is at the level of 10%. According to the constructed model, the depreciation of degree fixed assets in the first group of regions is significantly influenced by the financial situation of manufacturing enterprises. The growth dynamics in the share of unprofitable companies observed in it indicates the difficult financial situation of enterprises in this industry, the impossibility of modernization and technological renewal of production processes which contributes to an active increase in the depreciation degree of fixed assets. The financial situation of manufacturing enterprises is particularly difficult in the Astrakhan Oblast, where, according to 2020 data[9], the share of unprofitable enterprises was 57.6%. More than half of the manufacturing enterprises were unprofitable in the Republic of Khakassia (57.1%), Sevastopol (50.1%), almost half – in the Khanty-Mansi Autonomous Okrug (48.1%).

In the context of the currently increasing sanctions pressure on the Russian economy, restrictions on the import of high-tech equipment and exports of products manufactured by enterprises, which resulted from the deterioration of the geopolitical situation between Russia and Western countries in 2022, further deterioration of the financial situation of enterprises in this industry and an increase in the depreciation degree of their fixed assets is inevitable. To predict its dynamics by the end of 2024, we have carried out autoregressive

Table 2. Parameters of the regression model of the dependence of the depreciation degree of fixed assets of manufacturing enterprises on the share of unprofitable organizations in the first group of regions (with fixed effects)

	Coefficient	St. error	*t*-statistics	*P*-value
const	1.824	0.208	8.754	3.32E-14***
X	0.619	0.061	10.158	2.23E-17***
LSDV R-squared	0.607		*P*-value (*F*)	7.90E-17***
LSDV F (12, 107)	13.798		Durbin–Watson stat.	1.823
Schwarz crit.	187.775		Akaike crit.	151.537
Parameter rho	0.514		Hannan – Quinn crit.	166.254
Hausman test statistic:			*H* = 0.081	0.077
Non-linearity test (Zero hypothesis – dependence is linear)			Test statistics: 45.914	1.24E-11
White's test for heteroskedasticity (Zero hypothesis – homoscedasticity is observed – observations have a common error variance)			Chi-square (2) = 6460.7	0.082
Wooldridge test (Zero hypothesis – autocorrelation of residues)			Test statistics: *t* (2) = 9.499	0.061
Chi-square test (Zero hypothesis – normal distribution of residues)			Chi-square (2) = 143.483	0.069
Note: *** – statistical significance at the level of 1%. Source: own compilation.				

[9] Source: Official website of the Federal State Statistics Service.

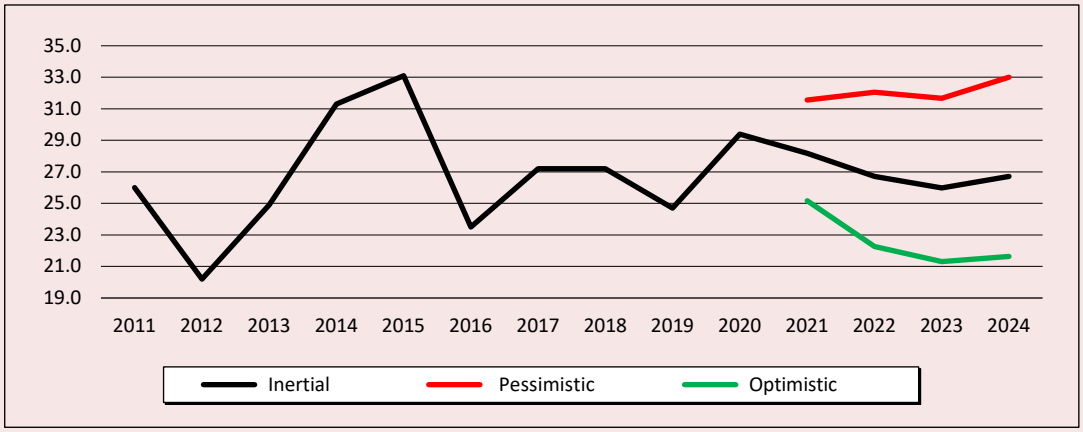
modeling of the dynamics of the key factor in the regression model presented above (the proportion of unprofitable manufacturing enterprises) using a moving average (*ARIMA*). This modeling method made it possible to form the most probable forecast of changes in the share of unprofitable enterprises in the regions of the first group taking into account the noted trends for the period from 2011 to 2020 (inertial) and to determine the boundaries of its possible fluctuations in the future. As an example, we present the results of the *ARIMA* model and forecasts of changes in the dynamics of the share of unprofitable manufacturing enterprises in one of Russia's regions – the Samara Oblast (*Tab. 3, Fig. 1*).

Table 3. Results of ARIMA modeling of the dynamics of the share of unprofitable manufacturing organizations in the Samara Oblast

	Coefficient	St. error*	*Z*	*P*-value
const	3.3	0.004	844.0	0.0000***
phi_1	0.647	0.214	3.025	0.0025***
phi_2	-0.864	0.133	-6.523	6.90e-11***
theta_1	-1.911	0.617	-3.095	0.0020***
theta_2	1.000	0.418	1.619	0.011***
R-square	0.859	Akaike crit.	-7.571	
Fixed *R*-square	0.788	Schwarz crit.	-5.755	
		Hannan – Quinn crit.	-9.562	
	Effective part	Imaginary part	Module	Frequency
AR				
Root 1	0.3742	-1.0084	1.0756	-0.1934
Root 2	0.3742	1.0084	1.0756	0.1934
MA				
Root 1	0.9554	-0.2954	1.0000	-0.0477
Root 2	0.9554	0.2954	1.0000	0.0477

Note: * – standard errors are calculated based on the Hessian; *** – statistical significance is at level 1%.
Source: own compilation.

Basic forecasts of the dynamics of the share of unprofitable manufacturing organizations in the Samara Oblast until the end of 2024, %



Source: own compilation.

The results of ARIMA modeling and regression analysis formed the basis for the forecast scenarios formed regarding changes in the depreciation degree of fixed assets of manufacturing enterprises. Calculations of the expected values of depreciation of fixed assets by the end of 2024 within the framework of the inertial forecast scenario taking into account the persistence of the noted trends, showed a high probability of further increase in worn-out funds in such regions as the Komi Republic, Astrakhan Oblast and Sevastopol (*Tab. 4*). These regions had the highest depreciation level of fixed assets of manufacturing enterprises and a high level of unprofitability of enterprises in this industry.

According to the constructed inertial scenario, by the end of 2024, an increase in the degree of worn-out fixed assets is possible in the Komi Republic from 78.2 to 78.8%, in the Astrakhan Oblast – from 67.6 to 71.3% and Sevastopol – from 67.6 to 78.5%. Further deterioration of the financial situation of enterprises in these regions, and such a scenario is currently more realistic, will lead to the impossibility of technological renewal of production processes and more serious depreciation of the funds used (in the Komi Republic up to 90.9%, the Astrakhan Oblast – 80.6% and Sevastopol – 93.1%). The implementation of this scenario will jeopardize the functioning of the entire manufacturing industry in these regions. The high proportion of unprofitable manufacturing enterprises in the Republic of Khakassia and the projected lack of positive dynamics of its changes in Chukotka Autonomous Okrug will not contribute to reducing the depreciation degree of fixed assets in them. By the end of 2024, the most likely implementation of the most pessimistic forecast scenario is that in the Republic of Khakassia, the depreciation degree of fixed assets of enterprises of this type of economic activity will reach 76.2%, and in Chukotka Autonomous Okrug – 91.6%. With such depreciation level of fixed assets, manufacturing enterprises will be unable to successfully develop and produce competitive products; therefore, industrial policy implemented at the federal and regional levels should consider these regions as priorities for attracting investment and upgrading fixed assets used by enterprises. The marked depreciation level of fixed assets of enterprises is critical and poses threats to the development of the manufacturing industry in these regions. If in the first group of regions the high depreciation level of fixed assets in the manufacturing industry was due to the difficult financial situation of enterprises, their high level of unprofitability, then in the second

Table 4. Depreciation degree of fixed assets of manufacturing enterprises in the regions of the first group in 2020 and forecast scenarios of its change by the end of 2024, %

Region	Depreciation degree of funds in 2020	Inertial forecast scenario	Pessimistic forecast scenario	Optimistic forecast scenario
Komi Republic	78.2	78.77	90.88	57.07
Astrakhan Oblast	67.6	71.31	80.58	50.96
Sevastopol	67.6	78.54	93.10	61.77
Republic of Khakassia	66.6	64.76	76.23	51.71
Chukotka AO	64.0	63.97	91.61	39.47
Samara Oblast	65.4	60.18	78.32	46.24
Khanty-Mansi AO	63.2	58.75	74.55	46.30
Kostroma AO	63.1	47.56	62.03	36.46
Yamalo-Nenets AO	62.6	57.40	69.11	47.68
Ryazan Oblast	62.4	54.59	66.56	39.46
Yaroslavl Oblast	62.4	51.24	65.64	40.00
Tambov Oblast	60.5	42.42	56.04	32.11
Note: own compilation.				

group, as shown by regression analysis, the main factor was the insufficient volume of investments in fixed assets attracted by enterprises:

$$Y = e^{4.11} \times X^{-0.032}, \quad (3)$$

where Y – depreciation degree of fixed assets in manufacturing (at the end of the year), %; $e^{4.11}$ – constant in the regression model; X – investments in fixed assets by type of activity "Manufacturing", million rubles.

When constructing the model, we have used 320 observations (for 32 regions for the period from 2011 to 2020). Panel diagnostics of Hausman and Breus – Pagan, assessment of the statistical significance of regression parameters and information criteria of Schwarz, Akaike and Hannan – Quinn confirmed the optimality of the regression model with fixed effects (*Tab. 5*). According to it, a decrease in the volume of attracted investments in fixed assets of enterprises of this economic activity type in the regions of the second group contributed to an increase in the depreciation degree of their fixed assets by 0.03%. The results of the study of the dynamics of attracted investments indicate that not all regions of the second group observed the marked trend. For example, in Saint Petersburg, the Republic of Bashkortostan, the Chelyabinsk, Kaliningrad, Nizhny Novgorod, Vologda, Moscow, Vladimir oblasts, an increase in the volume of attracted investments was noted.

The conducted autoregressive analysis using a moving average (*ARIMA*) made it possible to predict a further increase in the volume of attracted investments in these regions by the end of 2024 compared to 2020 and to generate forecast scenarios according to which a significant decrease in the depreciation degree of fixed assets of manufacturing enterprises is expected (*Tab. 6*). The active development of the manufacturing industry in these regions will help attract investment even in the face of more pessimistic scenarios and will make it possible to modernize production processes and technologies in some manufacturing enterprises. In some regions, such as Khabarovsk Krai, Nenets Autonomous Okrug and the Republic of Kalmykia, a steady decline in the volume of attracted investments in fixed assets of manufacturing enterprises was observed during the study period.

Table 5. Regression model parameters of the dependence of the depreciation degree of fixed assets of manufacturing enterprises on the investment volume in fixed assets in the second group of regions (with fixed effects)

	Coefficient	St. error	*t*-statistics	*P*-value
const	4.111	0.147	27.977	5.56E-84***
X	-0.032	0.017	-1.907	0.058*
LSDV R-squared	0.642		*P*-value (*F*)	4.20E-13***
LSDV F (32, 287)	4.657		Durbin–Watson stat.	1.39
Schwarz crit.	-191.882		Akaike crit.	-316.236
Parameter *rho*	0.786		Hannan – Quinn crit.	-266.579
Hausman test statistic:			*H* = 1.315	0.025
Non-linearity test (Zero hypothesis – dependence is linear)			Test statistics: 22.597	1.998E-06
White's test for heteroskedasticity (Zero hypothesis – homoscedasticity is observed – observations have a common error variance)			Chi-square (2) = 426.372	0.821
Wooldridge test (Zero hypothesis –autocorrelation of residues)			Test statistics: *t* (2) = 29.384	0.643
Chi-square test (Zero hypothesis – normal distribution of residues)			Chi-square (2) = 1.052674	0.591

Note: * – statistical significance at the level of 10%; *** – statistical significance at the level of 1%.
Source: own compilation.

Table 6. Depreciation degree of fixed assets of manufacturing enterprises in the regions of the second group at the end of 2020 and forecast scenarios of its change by the end of 2024, %

Region	Depreciation degree of funds in 2020	Inertial scenario	Pessimistic scenario	Optimistic scenario
Republic of North Ossetia	57.2	57.2	61.7	53.1
Republic of Kalmykia	56.1	58.7	60.2	57.2
Nenets AO	52.9	56.0	58.6	54.1
Khabarovsk Krai	54.7	64.3	75.8	54.6
Saint Petersburg	57.5	43.1	43.8	42.4
Chelyabinsk Oblast	56.9	42.4	42.8	42.0
Saratov Oblast	56.4	44.2	52.7	37.1
Nizhny Novgorod Oblast	56.3	43.5	44.1	43.0
Volgograd Oblast	56.3	43.4	44.2	42.7
Vologda Oblast	55.5	41.7	42.0	41.4
Belgorod Oblast	54.9	44.7	45.2	44.3
Tver Oblast	54.6	45.6	46.3	44.9
Altai Krai	54.4	45.5	46.6	44.5
Novosibirsk Oblast	54.3	44.2	44.8	43.5
Moscow Oblast	54.3	42.2	42.7	41.8
Lipetsk Oblast	53.9	44.0	44.9	43.1
Pskov Oblast	53.1	47.6	48.5	46.7
Vladimir Oblast	52.7	45.2	45.8	44.6
Rostov Oblast	52.3	44.4	44.8	44.0
Ulyanovsk Oblast	51.8	44.9	46.1	43.7
Omsk Oblast	51.8	41.7	43.3	40.2
Source: own compilation.				

Accordingly, during the *ARIMA* modeling of the dynamics of this indicator, a significant decrease in the investment volumes by the end of 2024 is predicted. For instance, according to the most likely forecast, taking into account the continuation of the trend noted during 2011–2020, it is possible to reduce the volume of attracted investments by 2.9 times in Khabarovsk Krai.

As a result, the depreciation degree of enterprises' fixed assets of this type of economic activity will increase to 64.3% (an inertial forecast scenario), and in the case of a pessimistic scenario, which is currently the most realistic, the depreciation of funds will increase to a very high level – 75.8%. *ARIMA* modeling allowed predicting a decrease in investments in fixed assets of manufacturing enterprises and in Nenets Autonomous Okrug (by 96.8%), as well as the Republic of Kalmykia (by 81.3%). The implementation of this forecast will negatively affect the depreciation degree of enterprises' fixed assets in these regions; therefore, we consider it important to provide priority state support to enterprises in regions with a characteristic decline in the volume of attracted investments in fixed assets in the manufacturing industry when implementing industrial policy at the federal and regional levels.

According to the data for the end of 2020, 41 regions entered the third group of territories with a low depreciation level of fixed assets of manufacturing enterprises. The regression analysis, the results of which are presented in *Table 7*, showed that the main factor influencing the dynamics of depreciation of enterprises' fixed assets of this regions' group, as well as the first group, is

Table 7. Parameters of the regression model of the dependence of the depreciation degree of fixed assets of manufacturing enterprises on the share of unprofitable organizations in the third group of regions (with fixed effects)

	Coefficient	St. error	*t*-statistics	*P*-value
const	2.575	0.091	28.17	0.0001***
X	0.339	0.027	12.195	0.0001***
LSDV R-squared	0.527		P-value (*F*)	5.39E-39***
LSDV F (32, 287)	9.987		Durbin – Watson stat.	1.88
Schwarz crit.	316.212		Akaike crit.	147.533
Parameter *rho*	0.474		Hannan – Quinn crit.	214.267
Hausman test statistic:			*H* = 2.428	0.0121
Non-linearity test (Zero hypothesis – dependence is linear)			Test statistics: 67.302	2.328E-16
White's test for heteroskedasticity (Zero hypothesis – homoscedasticity is observed – observations have a common error variance)			Chi-square (2) = 37604.1	0.061
Wooldridge test (Zero hypothesis –autocorrelation of residues)			Test statistics: *t* (2) = 18.203	0.118
Chi-square test (Zero hypothesis – normal distribution of residues)			Chi-square (2) = 452.555	0.535
Note *** – statistical significance at the level of 1%. Source: own compilation.				

the financial position of enterprises (share of unprofitable enterprises):

$$Y = e^{2.575} \times X^{0.339}, \quad (4)$$

where Y – depreciation degree of fixed assets in manufacturing (at the end of the year), %; $e^{2.575}$ – constant in the regression model; X – share of unprofitable organizations by type of activity "Manufacturing", % of the total number of organizations.

However, if in the first group of regions the growth of the share of unprofitable enterprises in the manufacturing industry contributed to an increase in the depreciation degree of fixed assets by 0.62%, then in the second group of regions – by 0.34%

The constructed model has statistically significant parameters, despite the low coefficient of determination, there is a close correlation between the variables in the model ($R = 0.73$). There is no heteroscedasticity in it, observations have a common error variance, there is no autocorrelation between residues, and their normal distribution is observed.

The *ARIMA* models of the dynamics of the share of unprofitable enterprises constructed for each region of this group and the regression model of its influence on the depreciation degree of fixed assets of manufacturing enterprises allowed forming the basic, most likely forecast scenarios for changes in the dynamics of this indicator until the end of 2024 (*Tab. 8*).

The inertial forecast scenario, taking into account the observed trends in the dynamics of changes in the share of unprofitable enterprises in the period 2011–2020, allowed identifying regions for which the problem of increasing the depreciation degree of enterprises' fixed assets may become a deterrent to the development of the manufacturing industry in the short term. Such regions include the Kurgan Oblast, where, due to the likely growth of the share of unprofitable enterprises, it is possible to increase the depreciation degree of fixed assets to 68.9%, Krasnodar Krai (up to 52.8%), the Ivanovo Oblast (up to 51.9%), the Murmansk Oblast (up to 46.9%), the Republic of Buryatia (up to 45.1%), the Sakhalin Oblast (up to 45%), the Republic of Sakha (up to 34.3%) and the Republic of Tyva (up to 32.1%). If a pessimistic scenario is realized, the probability of which is currently the highest, a more significant increase in the share of unprofitable enterprises in the manufacturing industry and depreciation of fixed assets is also possible. The problem of increasing the depreciation degree of

Table 8. Depreciation degree of fixed assets of manufacturing enterprises in the regions of the third group at the end of 2020 and forecast scenarios of its change by the end of 2024, %

Region	Depreciation degree of funds in 2020	Inertial scenario	Pessimistic scenario	Optimistic scenario
Ivanovo Oblast	51.5	51.9	76.2	35.4
Kurgan Oblast	50.2	68.9	87.8	37.7
Krasnodar Krai	50.0	52.8	59.2	47.0
Murmansk Oblast	44.6	46.9	50.4	43.7
Republic of Buryatia	43.1	45.1	52.2	38.9
Sakhalin Oblast	41.6	45.0	47.6	42.5
Republic of Sakha	34.3	40.9	47.6	32.1
Republic of Tyva	30.3	32.1	37.5	25.8
Voronezh Oblast	51.1	36.3	42.6	30.9
Perm Krai	50.8	37.2	43.0	32.2
Novgorod Oblast	50.2	46.5	49.7	43.5
Smolensk Oblast	50.2	43.7	51.9	36.8
Sverdlovsk Oblast	50.2	43.6	52.0	36.6
Kaluga Oblast	50.0	37.4	48.6	28.8
Penza Oblast	49.4	38.7	40.3	37.2
Republic of Tatarstan	44.1	41.1	43.5	38.8
Leningrad Oblast	48.9	40.4	43.7	37.2
Tyumen Oblast	46.7	41.5	45.8	37.6
Moscow	46.8	41.4	44.0	39.0
Source: own compilation.				

fixed assets is particularly critical for enterprises of the Ivanovo and Kurgan oblasts (see Tab. 8). In these regions, if a pessimistic scenario is implemented, the depreciation degree of enterprises' fixed assets in the manufacturing industry will exceed 76%.

In order to reduce their depreciation degree, it is necessary to increase the financial stability of industrial enterprises operating in these regions, and to attract preferential bank loans for technological renewal and modernization of production processes, public investments for the implementation of large-scale projects involving the introduction of innovations and advanced production technologies. Since 2015, the tool of state co-financing of ongoing projects in the manufacturing industry from the Industrial Development Fund of the Russian Federation (IDF) has been actively used in Russia as part of the industrial policy implemented at the federal and regional levels. This tool of state support of enterprises is actively used only in 50 Russia's entities out of 85. In addition, investment projects supported by the Fund are implemented mainly by actively developing, large manufacturing enterprises. Enterprises that have really worn out fixed assets and are in a difficult financial situation cannot participate in the implementation of investment projects supported by the Industrial Development Fund. When implementing industrial policy, investment support for enterprises should be carried out taking into account the depreciation of fixed assets of industrial enterprises in the regions.

Conclusion

In the study, we have confirmed the proposed hypothesis, and established the influence of not only investments in fixed assets, but also the financial situation of enterprises on the dynamics of depreciation of fixed assets of manufacturing enterprises in Russia's regions. We present a methodological approach based on statistical and regression analysis using panel data, autoregressive modeling with a moving average (*ARIMA*),

to identify factors that affect the dynamics of depreciation of fixed assets of manufacturing enterprises in various regions, and design a system of forecast scenarios for its changes in the future. The research result is the regions' grouping by the depreciation degree of fixed assets of manufacturing enterprises: we have identified regions with an extremely high depreciation level of funds, regions with depreciation level above and below the average Russian level. With the help of regression modeling, we have determined the key factors in the dynamics of depreciation of fixed assets: in the first and third groups of regions, it is the difficult financial situation of enterprises, in the second group – insufficient volume of attracted investments in fixed assets. Within the selected groups of regions, we have carried out autoregressive modeling of the dynamics of these factors using a moving average to form the most likely forecast scenarios for changes in the depreciation degree of fixed assets of manufacturing enterprises until 2024: inertial taking into account the current depreciation dynamics of fixed assets, pessimistic and optimistic.

As the research result, we have identified the regions in need of priority state support within the framework of the industrial policy implemented in Russia for the renewal of worn-out funds, namely: the Astrakhan, Ivanovo, Kurgan, Murmansk, Sakhalin oblasts, the Republics of Komi, Khakassia, North Ossetia, Kalmykia, Buryatia, Sakha, and Tyva, the city of Sevastopol, Chukotka and Nenets autonomous okrugs, Khabarovsk and Krasnodar krais. These spatial priorities for solving the depreciation issue of fixed assets of enterprises are recommended to be used when financing investment programs by the Industry Development Fund in Russia and the implementation of industrial policy at the federal level.

References

Abieva S.N., Kanabekova M.A. (2021). Investments in fixed assets in Kazakhstan. *Bulletin of National Academy of Sciences of the Republic of Kazakhstan*, 2(390), 139–145. DOI: 10.32014/2021.2518-1467.62

Al'zhanova F.G., Nurlanova N.K., Dnishev F.M. (2020). Assessment of level and priority guidelines of Kazakhstan regions' modernization. *Problemy razvitiya territorii=Problems of Territory's Development,* 1(105), 124–141. DOI: 10.15838/ptd.2020.1.105.9 (in Russian).

Boucekkine R., Oliveira Cruz B. (2015). Technological progress and investment: A non-technical survey. 2015. Available at: https://halshs.archives-ouvertes.fr/halshs-01145485/document (accessed: May 5, 2022).

Chizhova E.N., Balabanova G.G. (2017). Productivity as a criterion of the level of development enterprises of construction materials industry. *Vestnik BGTU im. V.G. Shukhova=Bulletin of BSTU named after V.G. Shukhov*, 6, 172–177. DOI: 10.12737/article_5926a05a880885.91931435 (in Russian).

Collings S. (2016). Fixed assets and investment property. In: *UK GAAP Financial Statement Disclosures Manual*. DOI: 10.1002/9781119283393.ch13

Dzhevitskaya E.S. (2017). Analysis of the threat of economic safety of Russian industrial enterprises. *Russian Journal of Management*, 5(4), 581–585. DOI: 10.29039/article_5a5df353e63c91.52556497 (in Russian).

Franik T. (2007). Depreciation of fixed assets and efficiency of investment and operation of a mining plant. *Gospodarka Surowcami Mineralnymi*, 23(4), 87–100.

Freiberg F., Scholz P. (2015). Evaluation of investment in modern manufacturing equipment using discrete event simulation. *Procedia Economics and Finance*, 34, 217–224. DOI: 10.1016/S2212-5671(15)01622-6

Gagarina G.Yu., Arkhipova L.S. (2017). Regional peculiarities of using production potential of the macro-region as a factor of Russian economy sustainability. *Vestnik REU im. G.V. Plekhanova=Vestnik of the Plekhanov Russian University of Economics*, 4(94), 126–137 (in Russian).

Gorid'ko N.P., Nizhegorodtsev R.M. (2011). Depreciation of fixed assets as a factor of inflation in the modern economy of Ukraine: The experience of econometric analysis. *Problemi ekonomiki=Economic Problems*, 3, 98–100 (in Russian).

Karlova N., Puzanova E., Bogacheva I. (2019). *Proizvoditel'nost' v promyshlennosti: faktory rosta. Analiticheskaya zapiska* [Industrial Productivity: Growth Factors. Analytical Note]. Moscow: Tsentral'nyi Bank Rossiiskoi Federatsii.

Kolesnik Y., Dobrovolska O., Malyuta I., Petrova A., Shulyak S. (2019). The investment model of fixed assets renovation in the agricultural industry: Case of Ukraine. *Investment Management and Financial Innovations*, 16(4), 229–239. DOI: 10.21511/imfi.16(4).2019.20

Kondenkova M.A. (2017). Statistical analysis of the volume of investments in fixed assets in the Russian Federation. In: *Innovatsionnaya ekonomika: mat-ly IV Mezhdunar. nauchn. konf. (g. Kazan', oktyabr' 2017 g.)* [Innovative Economy: Materials of the 4th International Scientific Conference (Kazan, October 2017)]. Kazan: Buk. Available at: https://moluch.ru/conf/econ/archive/262/12656/ (accessed: April 5, 2022; in Russian).

Kovaleva T.Yu. (2010). Evaluation of sufficiency of the information basis for the grounded analysis of the dynamics and the state of the capital assets. *Problemy sovremennoi ekonomiki=Problems of Modern Economics*, 1(33), 95–100 (in Russian).

Lazebnyk L. (2018). Renewal of fixed assets in Ukraine: Problems of their depreciation and use. *Economy of Ukraine*, 9, 62–74. DOI: 10.15407/economyukr.2018.08.062

Lugacheva L.I. (2001). Formation of investment resources of mechanical engineering and their institutional support. *Vestnik Novosibirskogo gosudarstvennogo universiteta. Seriya: Sotsial'no-ekonomicheskie nauki=Vestnik NSU. Series: Social and Economics Sciences*, 1(2), 118–140 (in Russian).

Lyadova E.V. (2017). Analysis of the dynamics of labor productivity in Russia: the macroeconomic aspect. *Vestnik Nizhegorodskogo universiteta im. N.I. Lobachevskogo. Seriya: Sotsial'nye nauki=Vestnik of Lobachevsky State University of Nizhni Novgorod. Series: Social Sciences*, 1(45), 46–53 (in Russian).

Ogorodnikova T.V., Solomein A.A., Orlov V.E., Shipunova I.G. (2020). Technical and economic assessment of the condition of fixed assets and the criterion of the validity of recovery investments. *Izvestiya Baikal'skogo gosudarstvennogo universiteta=Bulletin of Baikal State University*, 30(1), 89–99. DOI: 10.17150/2500-2759.2020.30(1).89-99 (in Russian).

Pechenskaya M.A. (2020). Contemporary problems of budget development of regional centers. *Aktual'nye problemy ekonomiki i prava=Actual Problems of Economics and Law*, 14(1), 40–56 (in Russian).

Postiguillo Garc a D., Blasco A., Ribal J. (2017). Modeling the depreciation rate of construction machinery. An Ordinary Least-Squares approach and quantile regression approach. In: *19th Edition of the Mathematical Modelling Conference Series at the Institute for Multidisciplinary Mathematics*. Available at: https://www.researchgate.net/publication/329040628_Modeling_the_depreciation_rate_of_construction_machinery_An_Ordinary_Least-Squares_approach_and_quantile_regression_approach (accessed: May 5, 2022).

Prokhorova E.K. (2019). Impact of the fixed assets state on the development of Russian industry in the context of international sanctions. *Vestnik mezhdunarodnogo instituta rynka=International Market Institute*, 1, 30–36 (in Russian).

Rozanova L.I., Tishkov S.V. (2018). Limitations of industrial development of innovations in conditions of high depreciation of fixed assets. *Ekonomika i menedzhment innovatsionnykh tekhnologii=Economics and Innovations Management*, 5. Available at: https://ekonomika.snauka.ru/2018/05/16019 (accessed: April 3, 2022; in Russian).

Saprykina M.S. (2020). Statistical analysis of the degree of wearing of fixed assets of enterprises of the industry of production and distribution of electric power in the Russian Federation. *Vektor ekonomiki=Economy Vector*, 11. Available at: http://www.vectoreconomy.ru/images/publications/2020/11/economic_theory/Saprykina.pdf (accessed: May 5, 2022; in Russian).

Tang L., Hao M., Zhang Y. (2013). Depreciation of fixed assets to capital budgeting decision analysis of the influence of independent. *Journal of Convergence Information Technology*, 8(10), 429–437. DOI: 10.4156/jcit.vol8.issue10.53

Urban S., Kowalska A.S. (2015). Investments and basic fixed assets in agriculture. *The Polish Statistician,* 60(9), 66–76. DOI: 10.5604/01.3001.0014.8301

Vylegzhanina E.V., Roslyakov V.A. (2018). Problem of high degree of wearing of fundamental means at treatment companies in Russia. *Mezhdunarodnyi zhurnal gumanitarnykh i estestvennykh nauk=International Journal of Humanities and Natural Sciences*, 12-2, 13–16 (in Russian).

Information about the Authors

Ilya V. Naumov – Candidate of Sciences (Economics), head of laboratory, Institute of Economics of the Ural Branch of the Russian Academy of Sciences (29, Moskovskaya Street, Yekaterinburg, 620014, Russian Federation; e-mail: ilia_naumov@list.ru)

Natalya L. Nikulina – Candidate of Sciences (Economics), Senior Researcher, Institute of Economics of the Ural Branch of the Russian Academy of Sciences (29, Moskovskaya Street, Yekaterinburg, 620014, Russian Federation; e-mail: nikulinanl@mail.ru)

Received May 16, 2022.

DOI: 10.15838/esc.2022.4.82.11
UDC 314.174, LBC 60.7

Demographic Dividends: Formation and Use in the CIS and the Baltic Countries

Valentina G. DOBROKHLEB
Institute of Socio-Economic Studies of Population – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: vdobrokhleb@mail.ru
ORCID: 0000-0002-4864-8231

Oksana V. KUCHMAEVA
Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: kuchmaeva@yandex.ru
ORCID: 0000-0003-0386-857X

Aleksei D. BRAGIN
Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: alexbragin562@gmail.com
ORCID: 0000-0002-4065-3546

Mehdi AFZALI
Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: mehdiafzali1991@gmail.com
ORCID: 0000-0002-9577-5639

For citation: Dobrokhleb V.G., Kuchmaeva O.V., Bragin A.D., Afzali M. (2022). Demographic dividends: Formation and use in the CIS and the Baltic countries. *Economic and Social Changes: Facts, Trends, Forecast,* 15(4), 172–188. DOI: 10.15838/esc.2022.4.82.11

Abstract. The article investigates one of the most pressing problems of the modern world – demographic aging and its impact on demographic security in the CIS. Changes in the age structure are happening on a global scale, and show increasing dynamics. At the same time, demographic aging has significant regional differences. The purpose of the study is to identify general trends, regional differences in population aging in the post-Soviet countries, the formation and use of demographic dividends. When analyzing the second demographic dividend, we propose to apply the term "resource potential of the older generation" that largely determines the capabilities of the aging population. We use the following methods: logical analysis, synthesis, generalization, induction and deduction, a systems approach to the analysis of demographic phenomena, calculations of demographic coefficients used in assessing the age structure, its dynamics and the formation of demographic dividends. The information base of the study includes data of the current accounting of demographic events presented by the Statistical Committee of the CIS, materials of Eurostat, the UN, domestic and foreign scientific publications, as well as materials of own research on the topic of the article. The main results of the work confirm the conclusion that the post-Soviet countries have significant differences in the age structure of their population and the intensity of demographic aging. We determine that the acceleration of the aging process was a general trend in most of them. This brings to the fore the problems associated with the need to form and effectively use the second demographic dividend, which will promote economic welfare of the countries.

Key words: demographic aging, first demographic dividend, second demographic dividend, post-Soviet countries.

Introduction. Problem statement

Countries go through different stages of the demographic transition in the course of their development. In a number of cases (two are known so far), "windows of demographic opportunities" open. States can use the demographic factor (size, structure, and quality of the population) for economic development. At the same time, it is necessary to take into account the trends in demographic dynamics, which requires significant organizational and financial investments in the implementation of economic and social policy, considering emerging demographic changes.

The purpose of the study is related to the identification of common trends, regional differences in the aging of the population of the post-Soviet countries, the formation and use of demographic dividends.

This paper attempts to determine the features of the relationship between the transformation of the population age structure in the post-Soviet countries, including trends in demographic aging and the formation of demographic dividends, and their socio-economic development. The results of the analysis can be significant for the construction of socio-economic policies by states at different stages of the demographic dividend implementation.

The concept of demographic security has become part of economic and political disciplines. In the vast majority of countries in the world, an assessment of the situation suggests an increasing influence of the demographic component on socio-economic development (Bloom et al., 2003; Chand, 2017; Misra, 2017; Kashif, Shahid, 2019). As a consequence, the governments of various states are objectively forced to deal with a wide range of demographic problems. Most often, in the context of demographic security, one considers the protection of socio-economic development of the country from demographic threats, which provides the potential for population reproduction.

Research in recent years proves that demographic factors play a significant role in the observed changes in the share of labor income. There is a link between changes in the share of the working-age population and per capita economic growth and poverty rates (Bloom et al., 2003; Macunovich, 2012). The mechanisms by which demographic change can affect economic performance, thereby ensuring the well-being of a country's population, are of particular interest. Increases in the proportion of the working-age population and decreases in the proportion of dependent children have been found to be associated with increases in gross domestic product per capita, which has a similarly positive effect on poverty reduction (Cruz, Ahmed, 2018).

The impact of age structure on socio-economic development has attracted the attention of researchers from different countries. For example, the demographic dividend has been one of the most significant factors that have contributed to economic growth in East Asian countries (Bloom et al., 1999; Bloom, Canning, 2001). The most significant demographic dividend was received in South Korea between 1965 and 2000 (Gribble, 2012).

The fixed-effects model analysis of the BRICS countries and the European Union has shown that there is a positive relationship between GDP growth rates and the demographic dividend (Misra, 2017). However, the situation is very differentiated even within individual regions. In Brazil, for example, a study of microdata suggests that attention needs to be paid to creating tools for a second demographic dividend (Baerlocher et al., 2019). A second demographic dividend is being considered for Spain. Using data from intergenerational transfer accounts, researchers conclude that after 2040, given population aging trends, using a second demographic dividend will be very problematic (Abío et al., 2017).

A number of states on the Asian continent have seen very significant increases in their young populations in recent years, which can contribute to economic growth. In Uzbekistan, for example, over 26 years (1991–2017), the share of the working-age population increased by almost 17.5%, and now this figure is almost 60.5% (Mirzakarimova, Khajiyev, 2020).

Evidence from South Asian countries shows that demographic potential without sound macroeconomic and demographic policies will not become a demographic dividend. Econometric models reveal that increasing the proportion of young dependents without effective education and health measures reduces economic growth in South Asian countries in the long run (Kashif, Shahid, 2019). Countries in the region need to think about the possibility of a second demographic dividend as the aging process progresses. An aging population leads to numerous problems in the region, including rising pension and health care costs, higher dependency ratios, and changing family dynamics (Chand, 2017).

Significant attention in the context of demographic dividend opportunities is currently being paid to African states, where the possible economic development benefits of the first demographic dividend are in question (Cardona et al., 2020).

The relationship between demographic and economic processes is complex and ambiguous. Demographic dividends with declining population growth rates increase well-being in the short term and decrease it in the long term (Ziesemer, Gässler, 2021). The identification of these relationships is due to the high relevance of the study of the demographic dynamics of the CIS and Baltic countries, as these regions are characterized by significant differences in the structure of population reproduction.

While previous works have demonstrated the significant contribution of the first demographic

dividend to China's economic growth (Wang, Mason, 2005), current research on China's age structure is focused on finding ways to take advantage of the second demographic dividend – increasing employment and labor force participation among the elderly (Fang, 2020). Researchers prove the increasing role of education and investment in education in the formation of human capital (Bairoliya, Miller, 2021) in China under the changing focus of demographic policy. Education policy, according to the researchers, will mitigate the effects of a possibly higher birth rate in the future, without increasing which it is difficult to solve the problems of the pension system caused by an aging population.

The increase in labor supply due to changing demographic structure is not a purely demographic gift. The magnitude of the benefit depends on the economy's ability to use additional workers productively. For the demographic dividend to work, the young population must have access to quality education, adequate nutrition, and health care.

Researchers identify a number of conditions required for the use of the benefits derived from the demographic dividend. According to Z.G. Kazbekova, who supports the viewpoint of D. Bloom and D. Canning (Bloom, Canning, 2004), the most important condition is the ability of the economy to create jobs for an ever-increasing working-age population; this depends on the quality of state institutions, macroeconomic governmental policy, and education policy. If the government does not pursue a proper macroeconomic policy aimed at implementing the demographic dividend, then the growth of working-age population can lead to rising unemployment, political instability, crime, and a decline in social capital; all this aggravates the problem of demographic security (Kazbekova, 2018).

In the conditions of demographic changes two directions of research become important. The first direction makes it possible to determine general trends in demographic dynamics in a particular region; the second is related to the identification of specific demographic trends. On the one hand, the age distribution of the populations in the countries that became independent in 1991 was influenced by general sociopolitical shocks, in particular the Great Patriotic War (1941–1945) and demographic policy measures (e.g., those aimed at increasing the birth rate in 1981–1983). On the other hand, there are very significant differences in the role of cultural factors in shaping demographic behavior patterns, national traditions, and economic well-being. All this determines the relevance of considering the transformation of the age distribution in the post-Soviet countries, identifying typical and specific characteristics, the stages of formation of the demographic dividend. The article presents the author's definitions of the second demographic dividend, as well as some findings on the dynamics of the population aging and the formation of the demographic dividend in the CIS and Baltic countries, and poses the problems of demographic security associated with these processes. The study focuses on the consideration of the demographic parameters of societal development as a condition for economic well-being.

Research methodology. Sources and methods

The research methodology is based on a system approach to the analysis of demographic phenomena, with wide application of both general scientific methods, including logical analysis, synthesis, generalization, induction and deduction, and specific tools for studying demographic events and processes, including calculations of demographic coefficients. The analysis is based on the data of the current record of demographic events, published on the website of the CIS Statistical Committee[1], in particular the data of the

[1] CIS Statistical Committee. Available at: http://www.cisstat.com/ (accessed: January 1, 2022).

compilation "Population and social indicators of the CIS countries and individual countries of the world 2017–2020". We used UN ECE, Department of Economic and Social Affairs Population Dynamics UN statistics since 1950, including forecasts up to 2050. To achieve this goal, we analyzed scientific publications on the issue, taking into account the results of the author's research.

We conducted calculations of demographic coefficients used in assessing the age structure, its dynamics, and the formation of demographic dividends, including the potential support ratio, considered as the ratio of the working-age population (15–64 years old) to one elderly person (aged 65 years and older). To analyze changes in the age structure, we used dependency ratios, which show the ratio of the population aged 0–14 and over 65 to the population aged 15–64.

The application of these approaches made it possible to identify general trends and differences in the demographic dynamics of the CIS and Baltic countries over the thirty years since the dissolution of the USSR, to show how demographic dividends are formed in these countries, and to formulate demographic security problems associated with these demographic processes, which determines the importance of taking demographic characteristics into account in economic development strategies.

General trends and differences in the dynamics of the age distribution in the post-Soviet countries

Researchers argue that the growing number and proportion of the elderly and old people in the population ("demographic aging") is a challenge for modern society, both globally and nationally (Sidorenko et al., 2013; Alper et al., 2016). Demographic aging is a process associated with a change in the age structure of the population, namely an increase in the number and proportion of old people in its composition. It touches on a variety of aspects of individual and family life, as well as society as a whole. These challenges also affect, to varying degrees, the countries of the former USSR, which are at different stages of the demographic transition. The multidirectional and differentiated changes in demographic processes in the countries of the former USSR have led to significant shifts in the age structure of the population.

The countries of the former Soviet Union can be divided into three groups according to the level of demographic aging.

In 2020, the demographically "oldest" countries in the former Soviet Union with the highest proportion of people aged 65 and older were Latvia (20.7%), Lithuania (20.6%), Estonia (20.4%), Ukraine (17.0%), Belarus (15.6%), Russia (15.5%), and Georgia (15.3%). The countries with a "young" population are most of the Central Asian countries and the Republic of Azerbaijan. In Uzbekistan and Turkmenistan, the share of the population aged 65 and older is less than 5% *(Tab. 1)*.

For most countries over the hundred years considered, the share of the population in the older age group has increased. At the same time, it is noteworthy that the relative number of elderly people in Azerbaijan, Uzbekistan, Turkmenistan, Kyrgyzstan and Tajikistan decreased during the 1990s, which is associated with the growth of fertility in these territories.

In the post-Soviet period, the process of demographic aging was most intense in the Baltic states, where the share of people aged 65 and older almost doubled.

The aging process is accompanied by a significant disproportion in the gender structure of the population at older ages *(Tab. 2)*. Due to the significant excess of women's life expectancy over that of men, there is a serious outnumbering of women, especially in the ages over 75. Belarus, Russia, Kazakhstan, and Kyrgyzstan stand out in this respect.

Table 1. Proportion of population aged 65 and older in the republics of the USSR and the former Soviet Union in 1950–2050, % (countries are presented in decreasing order in 2050)

Country	1950	1970	1990	2000	2010	2020	2030	2050
Lithuania	9.4	10.2	10.9	13.9	17.3	20.6	26.4	29.0
Estonia	10.6	11.8	11.7	15.0	17.5	20.4	23.6	28.7
Latvia	5.6	12.0	11.9	15.0	18.2	20.7	25.0	27.8
Ukraine	7.6	9.3	12.0	13.8	15.7	17.0	20.0	25.5
Belarus	8.6	9.0	10.7	13.5	14.0	15.6	20.5	24.0
Moldova	7.7	6.3	8.3	9.4	10.2	12.5	17.0	23.0
Russia	4.8	7.7	10.3	12.4	13.1	15.5	19.6	22.9
Georgia	10.1	7.7	9.3	12.9	14.2	15.3	18.5	21.8
Armenia	8.3	5.6	5.6	10.0	11.0	11.8	16.9	21.4
Azerbaijan	7.1	5.2	4.6	5.9	5.9	6.7	11.8	17.5
Kazakhstan	6.5	5.4	5.9	6.8	6.8	7.9	11.1	14.2
Uzbekistan	5.9	5.9	4.1	4.6	4.5	4.8	7.6	12.2
Turkmenistan	5.9	4.7	3.8	4.3	4.1	4.8	7.1	10.6
Kyrgyzstan	8.2	6.2	5.0	5.5	4.5	4.7	7.2	10.1
Tajikistan	4.4	5.1	3.8	3.6	3.3	3.2	5.1	7.5

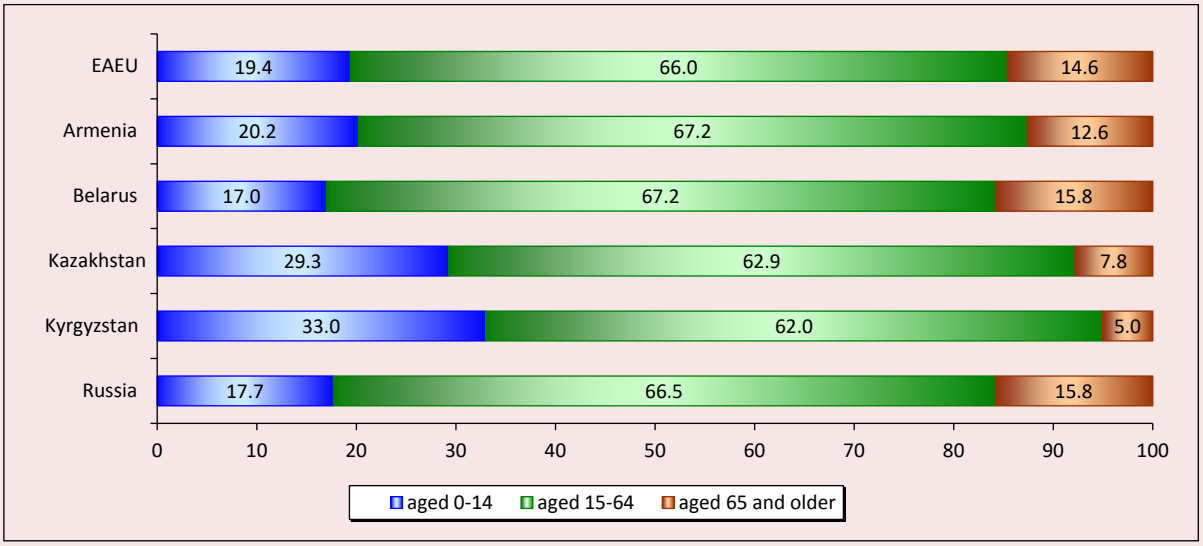
Source: United Nations, Department of Economic and Social Affairs, Population Division, 2019. *World Population Prospects 2019,* Volume II: Demographic Profiles (accessed: January 15, 2022).

Table 2. Ratio of men to women at older ages in the former USSR countries in 2020, number of men per 1,000 women

Country	Age, years								
	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95–99	100+
Lithuania	769	663	553	479	506	326	246	193	187
Estonia	819	699	629	502	396	329	269	192	140
Latvia	775	659	560	456	412	313	237	170	165
Ukraine	720	620	558	450	369	337	240	169	152
Belarus	749	640	582	414	328	257	203	107	69
Moldova	767	688	641	512	411	382	247	159	132
Russia	722	630	554	422	359	298	223	121	91
Georgia	785	708	633	549	465	436	317	198	162
Armenia	746	711	669	603	550	559	488	321	227
Azerbaijan	867	821	739	673	578	524	399	230	149
Kazakhstan	772	653	590	467	421	373	263	112	82
Uzbekistan	874	852	764	755	661	536	458	286	244
Turkmenistan	786	726	733	710	592	502	408	261	220
Kyrgyzstan	810	744	611	504	376	340	200	109	57
Tajikistan	922	877	862	919	759	698	719	463	308

Source: United Nations, Department of Economic and Social Affairs, Population Division, 2019. *World Population Prospects 2019,* Volume II: Demographic Profiles (accessed: January 15, 2022).

Figure 1. Proportion of age groups of the population as of January 1, 2021, % of the total population



Source: Statistical Yearbook of the Eurasian Economic Union. Moscow: Eurasian Economic Commission, 2021.

We turn our attention to the dynamics of demographic aging in the relatively new union, the Eurasian Economic Union (EAEU), which has been formed in the post-Soviet space since 2014. The Republic of Kazakhstan, the Russian Federation, the Republic of Belarus, the Republic of Armenia, and the Kyrgyz Republic joined the union. Its goal is the freedom of movement of capital, goods and services, and labor. The EAEU member states have significant demographic differences. For example, on the one hand, the populations of the republics of Kazakhstan and Kyrgyzstan are almost one-third younger than 15 years old, while the share of the population over 65 years old is 5–8% *(Fig. 1)*. On the other hand, in Russia and the Republic of Belarus the share of the younger generation is 17–18%, and the share of the elderly is about 16%. These circumstances make integrating countries interested in different areas of economic and social policy, the challenges of demographic security in the states are different.

The process of demographic aging affects all countries in the region. Three main features of this process can be distinguished: different levels of demographic aging in the countries of the former USSR; different rates of change in the age structure of the population; and demographic asymmetry of the genders across the countries of the region (the difference between the numbers of men and women in older age cohorts).

At the same time, the process of population aging in the former Soviet Union is currently not as dramatic as, for example, in Italy or Japan, where in 2019 the demographic dependency ratio of the elderly was 42.5 and 55.9%, respectively.

Demographic dividend, why do "demographic windows" open

In the course of demographic development in the modern world, countries develop a certain age structure of their populations. Researchers have shown that the proportion and size of the working-age population compared to the younger and older working-age cohorts increases during

certain periods (Bloom, Canning, 2001; Bloom, Canning, 2004; Wang et al., 2005; Cruz, Ahmed, 2018). In other words, the number of able-bodied people is greater than the number of dependents, the dependency ratio decreases. A "window of opportunity" or "demographic window" for economic growth opens, which is directly linked to changes in the age structure of the population.

At the same time, we should emphasize that the "demographic window" is a chance, an opportunity to obtain an economic benefit. The economic benefit received in the period of this demographic structure is considered a "demographic dividend"[2]. There are two main factors to gain a demographic dividend: first, the growth in the number and quality of the working-age population, and second, the formation of conditions in the labor market for employment. This dividend is called the first demographic dividend. Examples from different regions show that countries can miss their chance, because the probability of a demographic dividend appears for a limited period of time. According to UNFPA, there was a significant demographic dividend in Asia at the end of the twentieth century[3]. Asia's gross domestic product increased sevenfold, there was an economic boom, described as the "Asian economic miracle", which was largely due to the realization of demographic potential because of the reduction of the demographic burden. In Latin America at this time, growth was only twofold, due to unequal access to investments in education and health, including reproductive health and rights for women and girls (Barsukov, 2019).

Previously, the possibility of a demographic dividend was thought to close as the working generation aged. The demographic dividend is often associated with a simple life-cycle model in which people of working age produce more than they consume, and the difference is divided between dependents – children and pensioners. Researchers have shown that a more complex and probably closer-to-life model is possible, in which the forces that cause a demographic dividend to turn into its opposite are capable of causing another (second) demographic dividend to come to life[4] (Bloom et al., 2003; Bloom et al., 2006).

In this approach, the emergence of the second demographic dividend is related to the influence of the dynamics of the demographic structure on capital accumulation. For example, in response to rising life expectancy, middle-aged people may fundamentally change their financial behavior by saving more for retirement and building up their endowment and capital, thereby offsetting the decline in the overall savings rate caused by the increasing proportion of seniors with low savings rates (Bloom et al., 2006). P. Lee and E. Mason noted differences between the first and second demographic dividends. In their view, the first dividend brings a temporary benefit, while the second converts that benefit into more assets and sustainable development. None of this appears automatically, but is due to the implementation of effective policies. The dividend period is more of an opportunity than a guarantee of higher living standards (Lee, Mason, 2006). We should agree with the authors' conclusion: the degree to which the second demographic dividend is realized depends on how society supports older citizens.

An essential element in the formation of both the first and second demographic dividend is the ability of the state to build social policy with demographic change in mind, creating opportunities for further

[2] Demographic dividend. United Nations Population Fund. Available at: https://www.unfpa.org/demographic-dividend#readmore-expand (accessed January 16, 2022).

[3] Ibidem.

[4] Vasin S. Demographic aging and the demographic dividend. Available at: http://www.demoscope.ru/weekly/2008/0317/tema01.php (accessed: January 16, 2022).

socio-economic development with an equitable redistribution of public goods (Barsukov, 2019).

As it was noted earlier, the most important condition for using the benefits of the demographic dividend is the ability of the economy to create jobs for an increasing number of the working-age population and for an aging population as well; this ability depends on the quality of state institutions, macroeconomic policy, and education policy. In the absence of a proper governmental macroeconomic policy aimed at implementing the demographic dividend, an increase in the working-age population can lead to an increase in unemployment, political instability, crime, and a decrease in social capital (Kazbekova, 2018).

Today, there are an unprecedented number (1.8 billion) of young people living in the world. The term "youth bulge" or "youth bubble" has emerged in economic and demographic studies, referring to the significant increase in the population aged 15–29. One of the main indicators of a country's success in turning "youth bulge" into a demographic dividend is the level of youth employment. Unfortunately, in many countries around the world, the rate of increase in youth unemployment is about twice as high as for the labor force as a whole (Macunovich, 2012).

That is why the focus of UNFPA's work for young people in Eastern Europe and Central Asia is on such tasks as "promoting the rights of young people; preventing sexually-transmitted infections; involving young people in decision-making processes; supporting comprehensive age-appropriate sex education; combating practices that cause harm, such as early marriage and gender-based violence..."[5]

[5] UNFPA Annual Report, 2014. UNFPA – United Nations Population Fund. Available at: https:www.unfpa.org/fr/annual-report-2014 (accessed: January 17, 2022).

The second mechanism for the dividend is an increase in savings. As the dependency burden decreases, people can save more. This increase in the national savings rate raises the capital stock and leads to increased productivity as accumulated capital is invested. According to the researchers, the highest level of savings is observed among the population 40 to 65 years of age, which is due to two factors: people at this age, as a rule, have no need to invest in their children; people begin to save more before retirement in order to maintain a stable level of consumption over the next decades of their life (Kazbekova, 2018; Bloom et al., 2003).

The third mechanism is the formation of human capital. It requires investment in human capital, health, education, professional skills. Decreasing fertility leads to a healthier state of women and a reduction of their economic burden at home, an increase in women's participation in the economy. It also allows parents to put more resources into their child's upbringing and education, which leads to better health and educational outcomes.

The fourth growth mechanism is an increase in domestic demand, caused by the growth of GDP per capita and a decrease in the dependency ratio. An important condition for increasing domestic demand is an increase in the standard of living of the population and a policy of combating poverty.

When forming the demographic dividend, not only the number of age groups participating in the labor force is significant, but also their qualitative characteristics. The quality of the population is particularly important in the formation of the second demographic dividend (Rimashevskaya, 2003). The use of the definition of resource potential of the older generation can serve as a tool for identifying significant characteristics of older age groups. The resource potential of the older generation is a set of socially and personally significant characteristics of the elderly and old people. Methodologically, the

concept of resource potential allows distinguishing the "third" and "fourth" ages, taking into account the level of preservation of human potential of the older age cohorts. The main structural elements of resource potential are health, educational and qualification, motivational, social, material, and institutional (Dobrokhleb, 2014).

The situation in the field of age structure, condition and prospects of the formation of the demographic dividend is characterized by considerable diversity.

Demographic dividend in the countries of the former USSR.

The countries of the former Soviet Union differ significantly in the age structure of their populations and the intensity of their demographic processes. Within the framework of the demographic transition there are usually four stages or phases, determined by the ratio of the fertility dynamics and mortality processes[6]:

Stage 1 – high birth rate and high mortality;

Stage 2 – persistence of high fertility rates and declining mortality rates due to improved medicine, sanitation and hygiene, quality of life, the spread of urban lifestyles;

Stage 3 – low mortality and declining fertility; there is a change in fertility patterns, the spread of families with few children;

Stage 4 – fertility and mortality rates level off, further reduction of natural increase takes place.

In the context of the considered stages of the demographic transition, researchers distinguish several groups of post-Soviet countries:

❖ stage III of the demographic transition: Republic of Tajikistan, Kyrgyz Republic, Turkmenistan, Republic of Uzbekistan;

❖ stage IV – Republic of Azerbaijan, Republic of Armenia, Republic of Georgia;

Completion of the demographic transition – the Russian Federation, the Republic of Belarus, Ukraine, the Republic of Moldova (Bezverbnyi, Bardakova, 2021).

This differentiation is reflected in the formation of a demographic dividend.

Some demographic indicators make it possible to assess the situation with the demographic dividend in the post-Soviet countries. The most common is the potential support ratio – the number of working-age population (15–64 or 25–64 years old) per one elderly person (aged 65 and older). As the population ages, the potential support ratio decreases. This means that there are fewer and fewer potential workers to support the elderly. To analyze changes in the age structure of the population, we turn to dependency ratios, both general and calculated separately in relation to groups of people under the age of 15 or over 65, who are unemployable.

According to the authors' calculations, the gap in dependency ratio of the former USSR countries ranges from 1.4% for Ukraine (excess of the old-age dependency ratio over the young-age dependency ratio) to 57.3% for Tajikistan (excess of the young-age dependency ratio over the old-age dependency ratio). Considerable dependency ratio is observed in countries with significant numbers of young people (Tajikistan, Kyrgyzstan, Kazakhstan, Turkmenistan) and in countries with significant levels of aging (Latvia, Lithuania, Estonia). The structure of the dependency ratio differs: the first case refers to the prospect of growth of the absolute and relative workforce size, the second – to the growth of the old-age dependency, increasing life expectancy in general and working life in particular (with the creation of favorable conditions).

The Baltic states, as well as Russia, Belarus, Ukraine, Armenia, and Georgia, have largely exhausted their first demographic dividend. From

[6] Notestein F.W. (1945). Population: The long view. *Food for the world.*

1997 to 2011, the demographic dividend from the increase in the working-age population provided the Russian Federation with about one-third of its per capita GDP growth from an average annual rate of 4.9%[7]. The demographic aging of the population in the Georgian SSR was noted as early as 1959. Between the last two censuses in Georgia (2002–2014), the population in the 25–34 age group declined by 31% – more than twice as much as the rest of the population. Both natural and migratory population decline play a role (Sulaberidze, Archvadze, 2018). The decline in the potential support ratio here began no later than the 1990s (and in a number of states even earlier, for example, in Ukraine and Russia since the 1970s). This was due to a gradual decline in the number of people of working age against the backdrop of the aging of the population. However, a favorable situation – a large proportion of the working-age population – lasted for quite a long time, from the 1970s to the 2020s. And in recent years, the proportion of the population of working age, including the most highly productive (25–64 years old), has been most significant. This period is also characterized by a decrease in the dependency ratio due to a decrease in the young-age population (under the age of 15 and under 25). After 2020 in most of the above-mentioned states there is an increase in the old-age dependency ratio *(Tab. 3)*, which already now amounts to a very significant value, from 17.2% in Moldova to 32.9% in Latvia. By 2050, the proportion of people over 65 in the total population of the states will be from 1/5 to 1/3. In the medium term (about 2030) in these countries the proportion of the population under the age of 15 will increase – a waning demographic wave, a consequence of a certain increase in fertility, in particular in the early 1980s (under the influence of demographic policy measures). But in general, in this group of countries the dependency ratio will increase due to the

Table 3. Dependency and potential support ratios (2020 assessment, countries are presented in descending order of potential support ratio)

Country	Dependency ratio, %	Young-age dependency ratio, %	Old-age dependency ratio, %	Potential support ratio
Tajikistan	67.9	62.6	5.3	18.7
Turkmenistan	53.6	47.8	5.8	17.1
Uzbekistan	50.6	43.4	7.2	13.9
Kyrgyzstan	59.7	52.1	7.5	13.2
Azerbaijan	43.4	33.7	9.7	10.3
Kazakhstan	58.8	46.3	12.6	8.0
Armenia	48.4	30.9	17.5	5.7
Moldova	39.6	22.2	17.4	5.7
Belarus	48.9	25.7	23.2	4.3
Russia	51.2	27.8	23.5	4.3
Georgia	55.0	31.3	23.6	4.2
Ukraine	49.1	23.8	25.3	4.0
Lithuania	50.2	21.5	28.7	3.5
Estonia	58.4	26.1	32.3	3.1
Latvia	59.0	26.1	32.9	3.0

Source: compiled according to the Department of Economic and Social Affairs Population Dynamics UN. Available at: https://population.un.org/wpp/Download/Standard/Population/ (accessed: January 15, 2022).

[7] The World Bank. (2015). Searching for a New Silver Age in Russia: The Drivers and Impacts of Population Aging. 49 p.

growth of the share of the elderly, which actualizes the formation of tools and mechanisms to obtain a second demographic dividend. This problem is especially significant for the Baltic states, where the old-age dependency ratio already exceeds those of the young-age. The considered group of countries is currently characterized by the lowest values of the potential support coefficient (no more than 5.7).

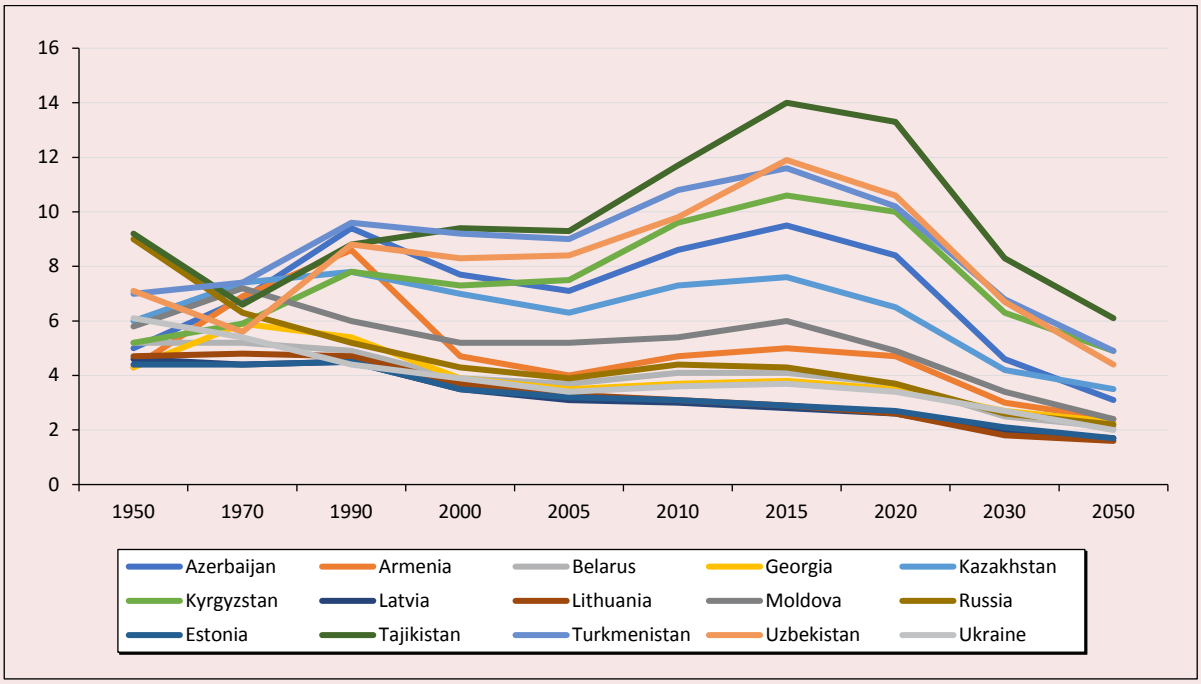
Moldova, where the increase in the population aged 25–64 years will last until 2030, closely adjoins the fairly representative group of countries discussed above. The first demographic window is still open for Azerbaijan as well.

The European countries of the former USSR are characterized by a higher rate of population aging. Russia, Moldova, Belarus, Ukraine, Lithuania, Latvia, and Estonia have almost exhausted their first demographic dividend.

Kazakhstan and Kyrgyzstan have a fairly young age structure, which is affected by fertility rates. The "window of opportunites" for the Kyrgyz Republic's demographic dividend opened in the 1980s due to a slight decrease in fertility, mortality and total fertility rates (Dzholdosheva, 2018). In the future, this will lead to the formation of a significant proportion of the working-age population and after 2030, reducing the burden of young people. However, the proportion of the elderly will also increase by 2050 only to 10.1% in Kyrgyzstan and 14.2% in Kazakhstan.

Tajikistan, Turkmenistan, and Uzbekistan still have very young populations, the proportion of the elderly is quite insignificant, and the dependency ratio is mainly formed by the young population of unemployable age. In Tajikistan, the young-age dependency ratio began to decline only in

Figure 2. Dynamics of the potential support ratio in the USSR republics and former USSR countries in 1950–2050 (ratio of the population aged 25–64 to 65 and older)



Source: compiled according to (Sulaberidze, Archvadze, 2018; Dzholdosheva, 2018; Bezverbnyi, Bardakova, 2021; Fang, 2020).

2005, along with an increase in the proportion of the population aged 25–64. These processes will continue in 2050. In Turkmenistan and Uzbekistan, the demographic window began to open a decade earlier. Countries should pay attention to the experience of states that were able to take advantage of the first demographic dividend by creating conditions for human capital formation, labor force participation, and increasing the productivity of young people.

The value of the dependency ratio in the post-Soviet states is converging after a significant increase in the indicator in 2005–2020 in Tajikistan, Turkmenistan, Uzbekistan, Kyrgyzstan and Azerbaijan, which is due to a significant, but fairly short-time excess of the working-age population over the number of unemployables. According to UN projections, after the rise of the potential support ratio, there will be a long-term decline *(Fig. 2)*. A significant decline in most countries by 2030 indicates the "closure of the first demographic window".

Conclusions

The post-Soviet countries are characterized by significant differentiation in the formation and use of demographic dividends, which is due to the specific demographic situation, cultural, social and economic determinants. Analysis of data on the proportion of the population aged 25–64 allows concluding that the proportion of the working-age people in the total population for Russia, Moldova, Belarus, Ukraine, Armenia, Azerbaijan, Lithuania, Latvia and Estonia is now at its peak. In the long term, after 2030, its absolute and relative numbers will decrease. In countries where the working-age population will soon dominate (Kyrgyzstan, Turkmenistan, Uzbekistan, Tajikistan), it is necessary to introduce institutions that motivate people to make savings and invest in the development of human potential, to promote the use of the demographic dividend in the economy. Uzbekistan is at the stage of an early demographic dividend, which provides a unique opportunity to achieve significant and lasting economic growth that can affect the well-being of the population, given the necessary investment in human capital, the formation of a flexible economic model, the introduction of innovative technologies, and increased opportunities for youth and women to participate in the socio-economic development of the country. According to UN projections of the age structure of Uzbekistan's population, the working-age population will peak around 2048. It is important to use this period.

The main challenge of the former USSR countries comes from the need for socio-economic development in the context of an aging population. The challenge is to use the positive aspects of aging societies (Fang, 2020). It is with this direction that the possibilities of solving the problems of demographic security are connected. Taking into account the features of the age distribution will make it possible to more effectively solve emerging economic problems. However, this implies the formation of policies aimed at the preservation, support and development of the resource potential of the older generation. The urgency of appropriate policies is exacerbated by the fact that the "demographic dividend" is followed by a time when the dependency ratio begins to increase again.

In this connection, the opinion of F. Notestein is relevant: "The problem of aging is not a problem at all, but only a pessimistic view of humanity's greatest triumph" (Notestein, 1954). But for this triumph to become a reality, decisive measures are needed to improve the living conditions of the older age cohorts in the former post-Soviet countries. Without real investment in the development of the potential of the aging population, there is no way out.

The expansion of opportunities for older age cohorts is connected, on the one hand, with the preservation of their resource potential (health, qualifications, motivation to participate in the labor market and in other socially useful activities), on the other hand, with reforming the structure of jobs, including for highly qualified professionals of older age. In addition, the second demographic dividend is realized if demographic changes lead to an increase in worker productivity. This is important to consider when forming educational and labor market policies.

Demography does not determine the fate of economic growth, but it is certainly a key determinant of an economy's growth potential. An aging population, combined with a declining birth rate, points to a very likely decline in future economic growth.

Productivity gains can reduce the impact of demographic shifts, and technological advances are an ideal source of productivity gains. However, it is important to note the following: technological advances increase productivity, but at the same time they can completely eliminate jobs, increasing unemployment.

It will be workers with computer and technological skills who will thrive in the economy of the future. As the age structure of the workforce changes in the future, so will the structure of the jobs that are in demand in the economy. This is important for countries that currently or in the near future can benefit from the first demographic dividend. The lack of highly productive jobs will lead to a migration outflow of the working-age population, which will also have a negative impact on the socio-economic and demographic situation in the future.

Productivity at older ages depends on health and disability policies, tax incentives, and barriers, especially the structure of retirement programs and pension measures. Countries that are on the threshold of a possible first demographic dividend (Turkmenistan, Tajikistan, Uzbekistan) or those countries where the window of demographic opportunity has not yet closed (Kyrgyzstan, Azerbaijan, Armenia) need to pay attention to creating the conditions for its realization, paying attention to education and the structure of youth employment. It is worth drawing on the experience of East Asian states, which place a high value on spending on children's education. Poor education during the period of declining birthrates will lead to a decrease in incomes of the population as fewer people in society work and their labor becomes inefficient.

For aging societies, an urgent problem is the formation of mechanisms that ensure the investment activity of people of older working age and the older generation as a whole. In addition, social policy in the interests of older people requires serious financial, personnel, organizational costs. A number of countries, in particular the United States of America, allocate a significant share of resources to health care for the elderly.

Countries around the world are implementing a strategy for older people – the Madrid international plan of action on ageing, adopted in 2002 by the Second World Assembly on Ageing. It includes actions to create conditions for older people to participate in development, to ensure health and well-being in old age, to create favorable conditions for life.

The extent to which the second dividend is realized depends on how society supports its citizens in old age. In developing countries, the elderly are supported by their families and the public sector, but beyond that they depend on the funds they have accumulated over the years, which include housing, retirement reserves, and personal savings. As the population ages,

the support burden on families and the state increases relative to GDP, which is a serious concern in many countries. However, through the second dividend, more middle-aged workers can substantially increase the amount of capital relative to GDP if policies encourage workers to save for after retirement, and appropriate institutions function in the country.

To the extent that countries are able to solve the problems associated with the aging of the population by expanding transfer programs – family, not backed by reserves, or state – the growth of assets is reduced, and the second dividend is reduced. In contrast, if workers have incentives to save and build retirement funds, an aging population can lead to more capital per worker and more income per capita. Thus, when developing socio-economic policy, it is necessary to focus on creating reliable financial systems that are credible and accessible to millions of people who want to secure their financial future. This needs to be done now, so that as the population ages, its potential for economic growth can be realized. Creating conditions for increasing the second demographic dividend can contribute to both more effective socio-economic development of countries and their security.

References

Abío G., Patxot C., Sánchez-Romero M., Souto G. The welfare state and demographic dividends. *Demographic Research*, 36(48), 1453–1490. DOI: 10.4054/DemRes.2017.36.48

Alper F., Alrep A., Ucan O. (2016). The economic impacts of aging societies. *International Journal of Economics and Financial Issues*, 3, 1225–1235.

Baerlocher D., Parente S.L., Rios-Neto E. (2019). Economic effects of demographic dividend in Brazilian regions. *The Journal of the Economics of Ageing*. DOI: https://doi.org/10.1016/j.jeoa

Bairoliya N., Miller R. (2001). Demographic transition, human capital and economic growth in China. *Journal of Economic Dynamics & Control*, 127, 104–117.

Barsukov V.N. (2019). From the demographic dividend to population ageing: World trends in the system-wide transition. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 12(4), 167–182. DOI: 10.15838/esc.2019.4.64.11 (in Russian).

Bezverbnyi V.A., Bardakova L.I. (2021). Demographic transition in the CIS countries: Trends and preliminary results. *DEMIS. Demograficheskie issledovaniya=DEMIS. Demographic Research,* 1(3), 11–22. DOI: 10.19181/demis.2021.1.3.2 (in Russian).

Bloom D., Canning D., Sevilla J. (2003). The demographic dividend: A new perspective on the economic consequences of population change. *The Rand Corporation*. Available at: https://www.rand.org/content/dam/rand/pubs/monograph_reports/2007/MR1274.pdf

Bloom D.E., Canning D. (2001). *Cumulative Causality, Economic Growth and the Demographic Transition*. Oxford.

Bloom D.E., Canning D. (2004). Global demographic change: Dimensions and economic significance. *National Bureau of Economic Research*, 10817. Available at: https://www.kansascityfed.org/publicat/sympos/2004/pdf/BloomCanning2004.pdf

Bloom D.E., Canning D., Evans D.K. et al. (1999). Population change and human development in Latin America. *Background paper for IPES 2000.* Harvard Institute for International Development.

Bloom D.E., Canning D., Mansfield R., Moore M. (2006). *Demographic Change, Social Security Systems, and Savings.* National Bureau of Economic Research.

Cardona C., Rusatira J.C., Cheng X. et al. (2020). Generating and capitalizing on the demographic dividend potential in sub-Saharan Africa: A conceptual framework from a systematic literature review. *Gates Open Research*, 4:145.

Chand M. (2017). Aging in South Asia: Challenges and opportunities. *South Asian Journal of Business Studies*. DOI: 10.1108/SAJBS-09-2017-0103

Cruz M., Ahmed S.A. (2018). On the impact of demographic change on economic growth and poverty. *World Development*, 105, 95–106. DOI: https://doi.org/10.1016/j.worlddev.2017.12.018

Dobrokhleb V.G. (2014). Population aging. Resource potential of the older generation. In: Rimashevskaya N.M. (Ed.). *Starshee pokolenie i budushchee* [The Older Generation and the Future]. Moscow: Ekonomicheskoe obrazovanie (in Russian).

Dzholdosheva D.S. (2018). Migration processes and the demographic dividend in the Kyrgyz Republic. *Innovatsii i investitsii=Innovation and Investment,* 10, 87–91 (in Russian).

Fang C. (2020). The second demographic dividend as a driver of China's growth. *China & World Economy,* 28(5), 26–44.

Gribble J. (2012). South Korea's demographic dividend. *Population Reference Bureau*, 6.

Kashif M.K., Shahid F.S.U. (2019). Role of demographic factors in economic growth of South Asian countries. *Journal of Economic Studies*. DOI: 10.1108/JES-08-2019-0373

Kazbekova Z. (2018). Impact of the demographic dividend on economic growth. *Population and Economics*, 2(4), 85–135. Available at: https://doi.org/10.3897/popecon.2.e36061

Lee R., Mason A. (2006). What is demographic dividend? *Finansy i razvitie=Finance and Development*. Available at: https:// ntaccounts.org/doc/repository/LM2006_Russian.pdf (in Russian).

Macunovich D.J. (2012). The role of demographics in precipitating economic downturns. *Journal of Population Economics,* 25(3), 783–807. URL: https://link.springer.com/article/10.1007/s00148-010-0329-5

Mirzakarimova M.M., Khajiyev B. (2020). Opportunities of getting demographic dividends in Uzbekistan. *International Journal of Advanced Science and Technology*, 29(8), 223–235.

Misra R. (2017). Impact of demographic dividend on economic growth: A study of BRICS and the EU. *International Studies*, 52(1–4), 99–117. DOI: 10.1177/0020881717714685

Notestein F. (1954). Some demographic aspects of aging. *Proceedings of the American Philosophical Society,* 98, 1, 38–45.

Rimashevskaya N.M. (2003). *Chelovek i reformy: sekrety vyzhivaniya* [Man and Reform: Secrets of Survival]. Moscow: RITs ISEPN RAN.

Sidorenko A.V., Mikhailova O.N. (2013). Implementation of the Madrid international plan of action on aging problems in the CIS countries: The first 10 years. *Uspekhi gerontologii=Advances in Gerontology,* 26(4), 585–593 (in Russian).

Sulaberidze A.V., Archvadze I.S. (2018). Features of demographic aging in Georgia. In: Denisenko M.B., Dmitriev R.V., Elizarov V.V. (Eds.). *Demograficheskoe razvitie postsovetskogo prostranstva: sb. statei i analiticheskikh mat-lov* [Demographic Development of the Post-Soviet Space: Coll. of Articles and Analytical Materials]. Moscow: Ekonomicheskii fakul'tet MGU imeni M.V. Lomonosova (in Russian).

Wang F., Mason A. (2005). Demographic dividend and prospects for economic development in China. *UN Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures*, Mexico City.

Ziesemer T., Gässler A. (2021). Ageing, human capital and demographic dividends with endogenous growth, labor supply and foreign capital. *Portuguese Economic Journal*, 20, 129–160. DOI: https://doi.org/10.1007/s10258-020-00176-2

Information about the Authors

Valentina G. Dobrokhleb – Doctor of Sciences (Economics), Professor, Chief Researcher, Institute of Socio-Economic Studies of Population – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (32, Nakhimovsky Avenue, Moscow, 117218, Russian Federation); Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (6, Fotieva Street, Moscow, 119333, Russian Federation; e-mail: vdobrokhleb@mail.ru)

Oksana V. Kuchmaeva – Doctor of Sciences (Economics), Professor, Chief Researcher, Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (6, Fotieva Street, Moscow, 119333, Russian Federation; e-mail: kuchmaeva@yandex.ru)

Aleksei D. Bragin – Junior Researcher, Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (6, Fotieva Street, Moscow, 119333, Russian Federation; e-mail: alexbragin562@gmail.com)

Mehdi Afzali – Candidate of Sciences (Sociology), Senior Researcher, Institute for Demographic Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (6, Fotieva Street, Moscow, 119333, Russian Federation; e-mail: mehdiafzali1991@gmail.com)

Received April 20, 2022.

DOI: 10.15838/esc.2022.4.82.12
UDC 316.342.6, LBC 60.54

Agents of Social Change: Determining Identification Criteria and Designing an Indicator Model

Irina N.
VOROBEVA
Cherepovets State University
Cherepovets, Russian Federation
e-mail: Vorobyova-i-n@yandex.ru
ORCID: 0000-0001-5970-051X; ResearcherID: AAX-4496-2021

Albina A.
MEKHOVA
Cherepovets State University
Cherepovets, Russian Federation
e-mail: albina_mehova@mail.ru
ORCID: 0000-0001-6377-3404; ResearcherID: AAX-5670-2021

Abstract. Modern Russian society is undergoing major changes. The concept of social change has a long history of theoretical understanding; usually, two approaches, the evolutionary and the revolutionary, are distinguished. We consider this concept within the framework of a new post-modernist or organizational-activity paradigm, when the "social agent" plays an active transformative role. The problem is of a complex interdisciplinary nature, directly related to the theory of social change, social and human capital, and the creative class. We try to find out which social groups of Russian society support changes and can become their agent-guides, what distinguishes them from other people, what their share is in the modern social structure of society, region, city. The article provides a justification for the relevance of identifying agents of social change as a social basis for the transformation and development of the territory. Based on the analysis of foreign and domestic research experience, we design our own notion of

For citation: Vorobeva I.N., Mekhova A.A. (2022). Agents of social change: Determining identification criteria and designing an indicator model. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 189–208. DOI: 10.15838/esc.2022.4.82.12

the term “agents of social change”, define the criteria for their identification, create an indicator model for empirical identification of the share of agents of social change in the social structure of the urban community. Theoretical judgments and conclusions are supported by empirical data from a sociological survey of Cherepovets residents. The choice of the city for approbation of the model is not accidental. Cherepovets has the status of a territory of advanced socio-economic development and is in dire need of agents of social change. According to an empirical study, in Cherepovets the core of social change is 4.6%, and the periphery of the core, which we designate as activists, is 17.4%. A comparison of the empirical results of our study and studies of leading Russian authors on the topic of social participation shows that Cherepovets, on average, reflects the general trend in Russia. The population as a whole has rather pronounced attitudes towards activity, while the behavioral practices expressed in our model in various forms of social participation are lagging behind significantly. We prove the validity of the developed model for studying the stated problem and empirically confirm that the development potential of the territory is largely determined by the presence of agents of social change in the social structure.

Key words: agents of social change, creative class, indicator model, social capital, social participation, social resources.

Problem statement

Social change is one of the broadest and most complex sociological concepts. In the broadest sense, social change refers to the transition of a social object from one state to another. The concept has a long history of theoretical understanding: from classical theories that consider social change as evolutionary having a natural character, to contemporary approaches that fundamentally revise the understanding of the driving forces of social change. There are progressive and regressive changes, global and local, etc. In the context of the problem posed, the postmodern approach is of interest (E. Giddens, P. Sztompka, M. Archer, V.A. Yadov, etc.). According to it, social change is a multifactorial process, which is influenced by changes in the external environment, economy, culture, political institutions, but the role of a social subject, which by its activity adapts social structures to the interests of social groups, seems decisive. Territorial development in this way depends on activists who are ready to support the change of the regional space in all its practices, from inclusion in the practices of co-participating management, urban improvement to social support for the needy segments of the population. But even everyday practices related to one’s own well-being are hardly implemented by the population in a fairly close range, and the speed and effectiveness of social changes are reduced due to weak support. Therefore, it is necessary to identify social groups, people with certain qualities and competencies, who are not only able to see new opportunities for themselves in changing, sometimes crisis conditions, but also inclined to construct a new reality, to social participation, who can become the social base of transformations, their guides and agents. Thus, the conceptualization of the concept of “agents of social change”, the formation of a theoretical and empirical indicator model for the analysis of this social group seems to be an urgent theoretical task.

A practically significant task is to identify the share of agents of social change in the social structure as a whole, the region and the city. In our opinion, the quantity and quality of the layer of this group largely determine the development potential of the territories. The empirical measurement of its share in the social structure requires the

formation of a valid sociological methodology, i.e. the determination of indicators of the identification of agents of social change. The problem is that there is no single approach to it in modern science. Thus, the main purpose of the study is to form our own approach of the concept of "agents of social change", to develop a theoretical and practical indicator model of measurement, empirical testing of the model and interpretation of the results obtained taking into account the specifics of a particular territory.

Theoretical foundations of the research

The problem of identifying and researching agents of social change is of a complex interdisciplinary nature, lies at the intersection of sociology, economics, management, and social psychology. Methodological guidelines of the research are found in classical and modern theories of social change, social and human capital, and the creative class.

Social change is understood as "the transition of a social object from one state to another, a significant modification in the social organization, its institutions and social structure, a change in social patterns of behavior, renewal and growth of the diversity of institutional forms" (Kirdina, 2003). In the article, social change is interpreted within the framework of the organizational-activity paradigm, which means that they are considered not as a natural-historical, but as a socio-historical process in which a "social agent" or "actor" plays an active transformative role.

From the point of view of the theory of the social field, "social reality appears as an interpersonal reality in which there is a network of connections, attachments, exchanges, is a fabric connecting people with each other" (Sztompka, 1996, p. 27). Agents of social change are subjects who create so-called nodes in this field that unite others to organize socially significant activities. These social actors "mobilize their own resources and modify, build structures so as to "enter into an interface" with them and actively engage in the process" (Sztompka, 1996, p. 6). The subjects appear in two aspects – collective action and individual interactions forming complex networks. It is they who create networks of norms, values, prescriptions, ideals, form a culture of interaction, develop and reform the channels of interaction of group ties. Social change is the activity of social agents, their practices that change social structures.

To highlight the qualities and attitudes of these subjects, we used such theoretical constructs as innovators, creative class, agents of renewal. J. Schumpeter (1949) was one of the first to try to identify agents of renewal, or agents of "creative destruction". In his theory, these are entrepreneurs who have not only a unique motivation for work, but also special personal characteristics: a desire for innovation, a sense of their own independence, faith in their own strength, and the ability to take risks. It is these traits and value attitudes that seem to be the most important characteristics of agents of social change. It is no coincidence that at the beginning of the 21st century, in the era of transition to the knowledge economy, many researchers again turn to J. Schumpeter calling him the prophet of innovation (Heertje, 2006; McCraw, 2007).

The well-known management theorist of the 20th century P. Drucker, justifying the possibility of managing change and trying to understand who the leaders of this process are, associated change with innovation, and primarily saw leaders in "knowledge workers", brain workers, workers with knowledge (Drucker, 1985). He argued that in a knowledge society it is innovation that becomes the most important source of profit, and "knowledge workers", intellectuals who easily master new knowledge, acquire increased importance. According to the scientist, such an employee is a leader of change both in business and in public administration. According to his theory, the manager of the knowledge society faces three most important tasks: the first is the ability to change, the

second is the willingness to constantly retrain in the work process and, finally, the third is the willingness to perform the functions of a leader, initiate changes and manage them (Drucker, 2002).

The category "creative class" is very consonant with the concept of "agents of social change" (Florida, 2002; Florida, 2005). R. Florida considered a part of the staff of new type organizations, people with a desire for constant renewal, knowledge exchange, capable of creativity, with a pronounced individuality, self-expression and tolerance to be a creative class. Later, the concept received a broader interpretation – a layer of people in society, the distinctive features of which are activity, tolerance, individuality, and self-expression. In the theory of R. Florida, the tolerance index integrates two indicators: the values index and the self-expression index. The values index is the confrontation degree between traditional and modern societies, the readiness of the community to accept new ideas. Self-expression index is the quality of life, democratic society, tolerance of migrants, national and sexual minorities. The latter was perceived ambiguously in the scientific community, the category "creative class" received a certain negative connotation, which at first narrowed its use. However, now the concepts of "creativity", "creative class", and "creative society" have become rather popular. In the context of the stated problem in this theory, in our opinion, there is a great heuristic potential.

In 2015, the Martin Prosperity Institute launched the research Global Creativity Index, in which it presented a new economic development model, called "3T": Talent, Technology and Tolerance. The researchers argue that in the knowledge economy, where consumption and production are based on intellectual capital, the 3T criteria and creativity in general are closely related to economic and social development.

The theme of the creative class is actively being developed in the Russian social science. The most interesting and close to our vision are the views on the problem of A.N. Pilyasov and O.Y. Kolesnikova (Pilyasov, Kolesnikova, 2008). They formulated a list of characteristics of the creative class, among which are acceptance of change and loyalty to the present; the ability to work at the junction of different professions and knowledge fields; willingness to change their residence place, place of work for the sake of professional growth and the opportunity to do what suits their interests; high self-esteem and developed reflection on the demand in the labor market.

O.I. Shkaratan identifies the category of information workers as part of the creative layer (Shkaratan, 2009). Like P. Drucker with his "knowledge workers", he focuses on the exceptional role of knowledge and education. It is important to emphasize that we are not talking about formal education, but about one that contributes to the constant increase of intellectual and cultural capital and the development of creative abilities. O.I. Shkaratan describes creative workers as super-efficient, whose unique knowledge and skills correspond to their unique incomes, and incomes, in turn, allow forming a special lifestyle. The scientist identified the following characteristics of the creative class: work involved in computer technology, a high degree of autonomy in work, education and access to its higher levels, constant readiness to change the type of activity, adaptation to more and more new conditions, the ability to find original solutions, their own needs for professional development, professional competence and the ability to "reprogram" yourself in accordance with new production tasks, the possession of scarce resources due to the inability to be replaced, for example, machines (Shkaratan, 2008).

Yu.G. Volkov (Volkov, 2014; Volkov, 2020) notes that the Russian creative class is not identified by income level, which means that income can be both high and below average, it is distinguished by self-motivation, the ability to work at the junction of

different knowledge fields (Volkov, 2010). The scientist speaks about the importance of interaction between state structures and the creative class: the state expands the possibilities of social development by including the social energy of the creative class. It is the creative class that hopes are pinned on the formation of a new Russian ideology that will help to successfully overcome crisis periods and build a successfully functioning socio-economic system (Volkov, 2013).

O.K. Trubitsyn also argues that it is the network structures of the creative class that take on the main role in ensuring innovative national development, displacing the importance of state structures in this process (Trubitsyn, 2019). Unlike R. Florida, who proves that the creative class accumulates in megacities and, as a rule, is formed among the technostructure, advanced programmers or representatives of creative industries, he says that the employment of workers in a certain field does not mean belonging to the creative class by itself. In his opinion, the new class is concentrated mainly in a small number of cities with good living conditions, and not always the largest ones.

A.Y. Maslennikova and S.P. Lapaev focus on the regional aspects of the formation of the creative class. The authors consider it very important for the socio-economic development of the territory to retain and consolidate creative people in the regions, small and medium-sized cities. This requires the loyalty of the state and society to the style and lifestyle of such people, the formation of conditions that ensure innovation and inventions, i.e. a purposeful state and regional policy of the formation and reproduction of the creative class is needed (Maslennikova, Lapaev, 2012).

The problem of social support for socio-economic transformations of modern society is actively being developed within the framework of the theory of social capital, the fundamental basis of which are the works of P. Bourdieu (Bourdieu, 2001; Bourdieu, 2002), R. Putnam (Putnam, 1995), J. Coleman (Coleman, 1988; Coleman, 2001). In Russian science, the origins of the theory of social capital can be seen in the activity-activist approach of V.A. Yadov. In his opinion, the decisive "mover" of social change is social actors, collective movements, civil societies and ordinary citizens. The author emphasizes that in this approach, the concept of "social resource" or "social capital" comes to the fore. An important place in the resource approach of V.A. Yadov is occupied by a block of individual and personal resources, among which are high personal self-esteem, internality (we prefer to use the category locus of responsibility), readiness for risk, ability to adapt (Yadov, 2001).

The use of the resource approach to study the possibilities of a particular territory was continued in the works of Yu.A. Drozdova. In her opinion, the region's development depends on the involvement of citizens and rural residents as the main territorial communities in the processes of modernization and social development of the territory, and the region's future is determined by its social resources (Drozdova, 2019).

Important characteristics of the social capital of the region, from our point of view, are the ability to adapt to environmental changes, the willingness to unite for joint actions, a sense of responsibility for the state of affairs in the place of residence (Guzhavina, Vorobeva, 2017; Guzhavina et al., 2018; Guzgavina, Mekhova, 2018). In our opinion, these characteristics harmoniously complement the important indicators of identifying a class of agents of social change. A high level of internal locus of responsibility for what is happening around creates a tendency to work together to transform the environment.

The social activity level, which is an indicator of the behavioral practices of agents of social change, can be studied through the category of social participation. For the first time, the concepts of civil, public and social participation began to appear in American sociological research

in such areas as civil society theory, urban studies, applied research and practices of working with the population in local communities (Fagence, 1977; Verba et al., 1978). In modern Western literature, the problem of participation has become part of the subject field of research carried out within the framework of the study of social networks, social identity, problems of local communities, partnerships, civil society (Newton, Giebler, 2008; Bartal et al., 2019; Chanda, Mishra, 2019; Bekalu et al., 2020).

There is no methodological unity in Russian science regarding the interpretation of participation. Often the terms social, civic, and public participation are used as synonyms. Some researchers interpret social participation as a generic category for political, civic and public participation. Others distinguish two forms of participation – actually social and political. The problem of "terminological confusion" is noted by I.A. Skalaban and L.I. Nikovskaya (Skalaban, 2011; Nikovskaya, Skalaban, 2017). Without delving into methodological discussions, let us say that most scientists, in an attempt to differentiate the forms and types of social participation, pay attention to the vertical (interaction with the authorities) and horizontal (joint activity of citizens themselves) dimensions of participation; formal (membership in public organizations) and informal participation; collective and individual participation; the main marker of social participation, its main criterion is considered to be a significant social result.

Territorial aspects of the study of the practice of social participation are presented in the works of A.A. Merzlyakov and V.S. Bogdanov (Merzlyakov, 2014; Bogdanov, Merzlyakov, 2018). The authors say that the potential of social participation depends on the socio-cultural field of the region which includes values, customs, traditions, and convincingly show that different conditions for social participation were formed in regions with different levels of socio-cultural development.

We also find methodological guidelines for the study of agents of social change in new approaches to the stratification of society. One of the approaches is connected with the theories of life styles, consumption styles. In the context of the topic we have stated, the practical application of these hikes seems interesting. One of the well-known sociographic methods of identifying consumption styles belongs to E.S. Petrenko (Petrenko, 2011). The typology of consumption styles of the Public Opinion Foundation is based on socio- and psychography (Galitskaya et al., 2012). We also consider it necessary to identify some iconic characteristics of the lifestyle and consumption of agents of social change, to determine their empirical markers.

Innovative practices in the field of consumption, labor, leisure and, of course, in the field of social participation are impossible today without special competencies, in particular digital ones. A number of modern researchers pay attention to it (Dezuanni, Foth, 2019; Batova, 2019; Sadovaya et al., 2019; Sokolov, Barsky, 2021; Zaitseva, 2021). In our opinion, digital competencies are only an important, in contemporary conditions, a necessary condition for the formation of more significant competencies, especially if we are talking about agents of social change. We mean the so-called soft skills – a wide range of competencies including the ability to organize, negotiate, work in a team, take responsibility, effectively organize your time and quickly adapt to new situations, think and act outside the box, etc. As thematic scientific reviews show, interest in this problem in foreign and Russian science has recently been extremely high (Tsalikova, Pakhotina, 2019). Basically, scientists pay attention to the demand for these competencies in the labor market, the need to transform the education system, create methods and tools for the formation of soft skills[1] (Rimskaya et al., 2021; Uvarina, Savchenkov, 2021).

[1] Stepanova A., Dyatlikovich V. (2017). Research "Russia 2025: from personnel to talents". *TASS*, October 27, 2017. Available at: https://tass.ru/ekonomika/4680191

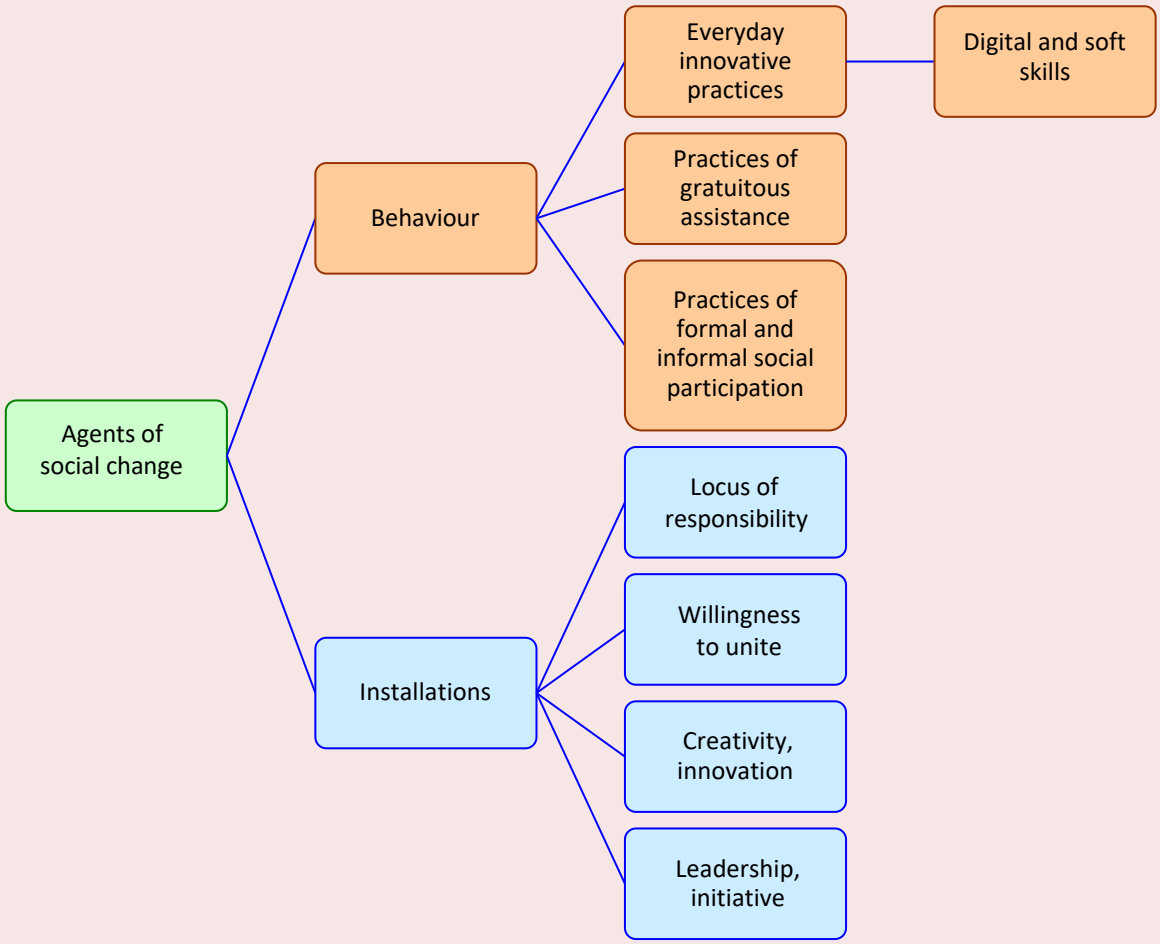
Consequently, the variety of theoretical and practical approaches to the problem under study proves its interdisciplinarity and relevance both in social science and in practice. Generalization of Russian and foreign experience allows drawing several conclusions. First, it is obvious that the main driver of influence and incentive for research in this area have been drastic changes in the economy. The knowledge economy requires flexible technologies, brings a person to the fore and imposes new requirements on them as an employee. In order to be effective yourself and make one's organization effective and profitable, it is necessary to have certain qualities. Such an economy-based approach, including attempts to describe a new type of employee, is more distinct in the works of foreign authors (J. Schumpeter, P. Drucker, R. Florida, etc.). In Russian science, in our opinion, the approaches are somewhat broader: the knowledge economy, the knowledge society require new paradigms of human capital as a whole, and new mechanisms for its formation. In addition to economic aspects and the requirements of the contemporary labor market, the works of Russian scientists more often explore social aspects, a new type of human capital is considered as the basis of social capital, as a resource for the social development including for more effective government activities – social participation in the broad sense of the word, participatory design, etc. (D.V. Afanasyev, Yu.G. Volkov, I.A. Skalaban, L.I. Nikovskaya, etc.).

Second, with all the variety of approaches, the purpose of the research in this area is the same – to form an image of the "advanced" part of the population, which, thanks to its qualities, characteristics and competencies, not only quickly fits into the new reality, but also creates it itself. Scientists in the above review call this layer differently: creative class, information workers, knowledge workers, etc., focusing either on its main characteristic or on some aspect of its function. In our opinion, these designations are conditional. The main thing is that all the authors tried to define the image of the avant-garde layer, its features and characteristics. These features are difficult to verify and measure, hence the polyphony of approaches to their definition, but the general view of the need to include in this list the acceptance of changes and crises as new opportunities, the availability of competencies to use these opportunities and the creation of new technologies and practices both in the production sector and in everyday life, which is clearly represents as a new social reality. But the researchers do not single out in this list the features on the attitudes of behavior and competence which seems important to us.

Based on a deep analysis and understanding of various approaches, we have tried to systematize these features and characteristics into a kind of theoretical construct "agents of social change" to identify a layer of people who support transformative social activities and are included in it, who have a certain set of attitudes and behavioral practices that are in demand in modern conditions of social transformations. The activity of agents of social change in our interpretation consists in participating management, inclusion in the practices of organizing social regional space. According to P. Sztompka's classification, these subjects represent the meso-level, to which he refers large groups, social communities (Sztompka, 1996, p. 44). But in our case, agents are people who are inclined to organize these communities for certain purposes, often in line with everyday practices of social participation, to form networks of like-minded people around themselves or to join them.

In our opinion, these subjects should have the following attitudes: an internal locus of responsibility for affairs in the surrounding social reality, a tendency to unite to solve emerging problems in order to become nodes of the social field, initiative, innovation, a high adaptation level to changing conditions. In addition, they must

Figure 1. Theoretical model for identifying agents of social change



Source: own compilation.

have developed digital competencies due to the partial displacement of social reality into the digital environment. Such attitudes form the value core of agents of social change. The second defining component is already formed behavioral practices of social participation. They are reflected in real social actions, which, for the convenience of practical measurement, we have divided into three types: formal social participation, informal assistance, and helping behavior.

Methodology and method of the research

The theoretical model for identifying agents of social change is based on two blocks – attitudes and behavior (*Fig. 1*).

Based on the analysis and understanding of Russian and foreign theoretical and methodological approaches to the problem under study, we have identified a list of attitudes and behavioral practices which, in our opinion, are in demand in contemporary Russian society and act as distinctive features, markers of agents of social change. The installation block includes the following indicators (markers): the responsibility locus (agents of social change are distinguished by the priority of the internal locus of responsibility), the willingness to unite, the propensity for innovation, creativity, leadership attitude, the desire to take initiative.

The behavioral block also consists of four main elements: everyday innovative practices that involve the possession of digital and soft skills; helping behavior – practices of gratuitous assistance and volunteering; involvement in social and political participation (formal and informal).

The model allows dividing the population into groups depending on the presence and formation degree of these attitudes and behavioral practices, namely, on proximity to a group of agents of social change.

Based on the theoretical model, an indicator model was developed for the empirical identification and measurement of the share of agents of social change in the social structure. The indicator model formed the basis of the sociological research methodology; the indicators are the answers to the questions of the sociological questionnaire.

There are several questions for each indicator (marker). For example, in the installation block, the locus and level of responsibility are identified by the questions "Do you feel responsible for what is happening in the house / in the neighborhood / in the organization, the enterprise where you work / in the city / in the country?"; "Do you agree with the judgment: "My financial situation in the present and future depends primarily on me", etc.

Willingness to unite is determined by the question "There are people who are ready to unite for joint actions to solve common problems, and there are those who are not ready to unite with other people. Are you with those who are ready to unite?" It is concretized by questions: "Are you ready to unite with other people to <...> participate in the house management / improve the territory / help the poor / fight against crime / protest against the wrong actions of the authorities / protect own rights / spend leisure time?" etc.

Creativity, propensity for innovation, initiative, leadership is revealed by the answers to the questions "How much do you agree with the judgments <...>?: "it is typical for me to put forward a large number of ideas"; "I prefer to be a leader, not a performer, to take the initiative"; "the process of creative activity gives me emotional satisfaction"; "it is important for me to realize my abilities"; "I easily get used to changes in the workforce, in life, at work"; "I am constantly trying to improve my education"; "I will be engaged in creating something new, even if it involves difficulties and risks"; "my sociability contributes to solving important problems for me", etc.

In order to analyze the data, we assume to use the index method. We measure almost all indicator questions of the installation block on the classical scale "Yes", "Rather yes", "Rather no", "No", "Hesitate to respond". The respondents' answers are assigned the following scale values: "Yes" – 5; "Rather yes" – 4; "Hesitate to respond" – 3; "Rather no" – 2; "No" – 1. The index is the arithmetic mean of the values assigned to the answers. For each respondent, we calculate private indexes for each question; the index by indicator (marker) is the average of the private indexes on the issues of this indicator; the total index for the block is the average of the indices by indicators.

The questions of the behavioral block, aimed at identifying innovative practices, are mainly based on the format "Could you say what of the above you did in the last year or two?". For instance, to identify innovative consumer and everyday practices, we propose a list of thirty practices, most of which involve the possession of digital and soft skills, for example: "book tickets, hotels, accommodation via the Internet", "use online banking", "use smart technology", "make rational proposals, file a patent", "get additional education including remotely or online", "participate in research conferences, seminars including online", etc.

Formal and informal social participation is identified by the question "Do you participate in the activities of public organizations?" which is accompanied by an extensive list of public organizations. The question presupposes answers for each of them: "Yes, I am a member of this organization / I am not a member of this

organization, but I took part in events, actions of this organization / No, I do not participate in the activities of the organization in any way". In addition, the questionnaire includes the question "In which of the listed public affairs did you voluntarily and free of charge participate in the last year or two?". The same format of the question is used to identify practices of helping behavior, gratuitous assistance: "What of the above did you do for other people for free over the previous year?" The answer options list all types of assistance from material, moral to informational, consulting and just neighborly (call a doctor, look after other people's children). The index for such questions is calculated depending on the number of answer options and the amount of the respondent's choices. The sum of the choices is assigned certain values-weights. For example, for a question involving a choice from a list of 26 names of practices, the value 1 is assigned if the respondent chose from 0 to 4 practices, the value 2 – from 5 to 10, the value 3 – from 11 to 15, the value 4 – from 16 to 20 and the value 5 – from 21 or more. We have another example: when answering the question "Are you a member of any official public organization?" the value 1 is assigned if the respondent has not chosen any option; 2 if he is a member of one organization; 3 – two choices, 4 – three or four choices, 5 – more than four choices. Accordingly, private and general indexes are also calculated in the behavioral block. The integral index of belonging to a group of agents of social change is calculated for each respondent as an average between the indices of the blocks of attitudes and behavior; it can reach values from 5 to 1.

In April 2022, we tested the indicator model during a survey of the adult population in Cherepovets in order to identify the proportion of agents of social change[2].

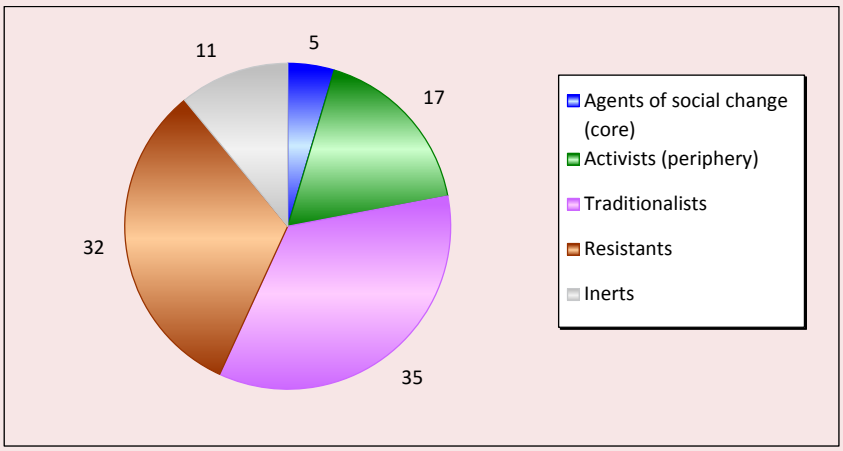
[2] Sociological survey of the population over 18 years old at the place of residence by face-to-face interviewing, a sample of 668 people, quotas by gender and age in accordance with the gender and age structure. Statistical error does not exceed 5%.

Research results

The research made it possible to identify five population groups depending on the proximity to the group of agents of social change. The group of agents of social change itself, in turn, is divided into the core, whose representatives meet all the criteria of the indicator model (integral index in the range 5–4), there are only 4.6% of them in Cherepovets, and the periphery (activists). Activists do not have all the features, but they carry a great potential for social activity, most often they have significantly developed value attitudes, but at the same time they do not reach the core level of behavioral practices and sometimes require external mobilization (index in the range 4–3.34), they are 17.4% in Cherepovets. The third, the largest group, we conditionally called the traditionalists (index in the range of 3.33–2.67); its share was 34.8%. These are those who are afraid of changes, want to stay in their comfort zone, and adhere to the usual traditional practices. They do not like change, but they do not particularly resist it, unlike the fourth group – opponents of change. We have conditionally designated them as resistant (index 2.66–2). They do not just dislike change, but they resist it, slow it down. According to the research, such respondents was 32.2%. The fifth group (10.9%) included those who have practically no signs of activity and creativity. These are socially passive citizens; they distance themselves from the problems of society and collective activity. We conditionally called them inert (index 2–1; *Fig. 2*).

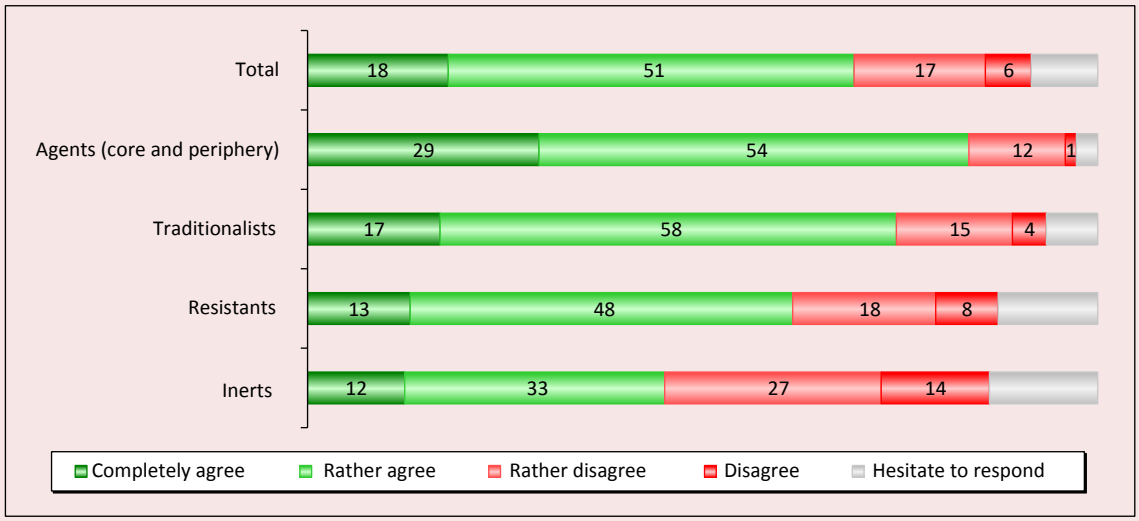
The difference between agents of social change from other groups can be described through the distribution of answers to basic questions. The core group is not statistically representative enough, so it is worth paying attention to the responses of the periphery of the agents of social change, whom we have designated as activists. For the representativeness of the data, we combined these two groups, which together make up 22% and are statistically significant for identifying patterns.

Figure 2. Distribution of the population of Cherepovets by groups according to the indicator model, %



Source (here and further): sociological survey in Cherepovets.

Figure 3. Distribution of answers to the question "How much do you agree with the judgment "The main thing in life is initiative, entrepreneurship, the search for new things in work and life", in the context of the identified population groups,%

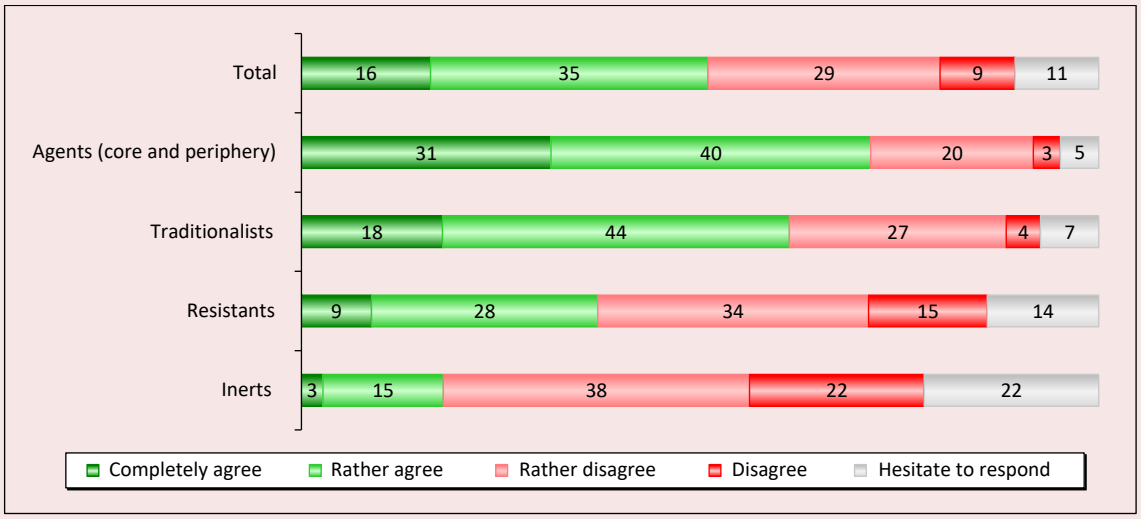


Agents of social change have a highly developed motivation for achievement; 83% of the representatives of this group fully or rather agree with the judgment "The main thing in life is initiative, entrepreneurship, search for new things in work and life". Among the inert ones, there was only 45% (*Fig. 3*). 74% of agents of social change replied that they prefer to take the initiative, to be a leader, rather than a subordinate.

Agents of social change are creative, prone to innovation and creativity: 71% agreed with the judgment "It is typical for me to put forward and express a large number of different ideas" (among the inert only 18%), 82% – "The process of creative activity gives me emotional satisfaction" (*Fig. 4*).

Agents of social change are characterized by a developed motivation to help others and

Figure 4. Distribution of answers to the question "How much do you agree with the judgment "Is it typical for me to put forward and express a large number of different ideas?", in the context of the identified population groups,%



transform their environment. Among the agents of social change, 46% agreed with the judgment "For the sake of generally significant goals, I am ready to sacrifice some of my money, time, and strength", while among the inert – only 15%. The majority of the population adheres to the opposite attitude: "I am not ready to sacrifice my efforts, money, and time for the sake of generally significant goals".

Eighty three percent of representatives of the group of agents of social change are aimed at continuous development and raising, improving of education; among the entire population – only 58%, among the inert – only 10% (*Fig. 5*).

Figure 5. Distribution of answers to the question "How much do you agree with the judgment "I am constantly trying to develop, improve my education?" in the context of the identified population groups, %

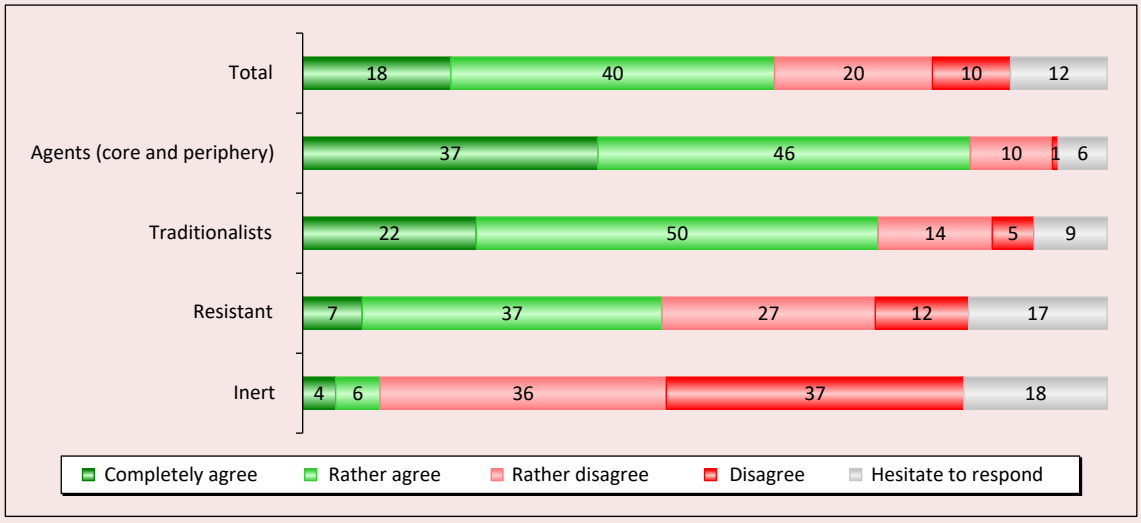


Table 1. Distribution of answers to the question "What of the above did you do in the last year or two at work?" (select all the necessary answers), %

Respond option	For the sample as a whole	Agents (core and periphery)	Traditionalists	Resistants	Inerts
I do not work	*29*	*12*	*18*	*38*	*69*
Search for the necessary information using the Internet	42	**67**	48	32	3
Get additional education	21	**41**	25	9	0
Work overtime, on weekends	42	**63**	46	34	15
Help new employees, colleagues	35	**59**	41	20	6
Spend leisure time with workmates	22	**37**	25	16	1
Earn extra money, have additional earnings	23	**34**	38	17	6
Do a job necessary for the organization with no remuneration	24	**39**	37	19	4
Make rational proposals, be the initiator of innovations at work	16	**33**	19	9	0
Work remotely	16	**29**	20	7	3
Change profession, specialty	11	**18**	14	8	0
Purchase (including online use) books, newspapers, magazines by profession, specialty	12	**29**	11	4	1
Participate in industry, professional conferences, exhibitions	7	**20**	7	2	0
None of the above	2	**0**	1	5	10
Source: sociological survey results of the population of Cherepovets.					

Attitudes are the basis of active activity, but they do not always develop into behavioral reactions. The behavior of agents of social change corresponds to activist attitudes. The behavioral block of the indicator model allows measuring it. In terms of measuring the behavioral aspects of the constant development mindset, the question "What of the above did you do in the last year or two at work?" was introduced into the toolkit. Among the agents of social change, 41% have recently received additional education, 33% have made rational proposals, were initiators of innovations, participated in conferences (*Tab. 1*).

It is not by chance that we conditionally determined the desired group as agents of social change. It was important to identify not just creativity and innovation, but also the social orientation of these qualities. In this part, the attitudes to joint activities for solving social problems and the responsibility locus are of particular interest; 71% of agents of social change feel responsible for what is happening in the house, yard; among the general population – only 49%, among the inert – 25% (*Fig. 6*); 57% of agents of social change feel responsible for affairs in the city, only 32% among all citizens, and 8% among the inert.

Agents of social change have a high propensity for collective action: 83% are ready to unite for the arrangement of the residence territory (among the opponents of change, less than half – 43%, among the inert – 21%; *Fig. 7*).

Figure 6. Distribution of answers to the question "Do you feel responsible for what is happening in your house, yard", in the context of the identified population groups, %

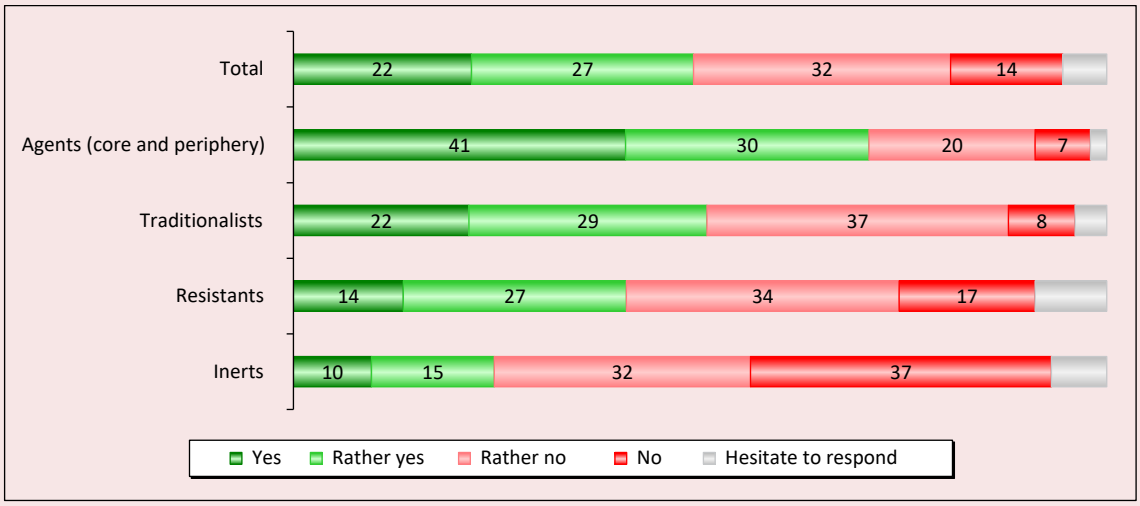
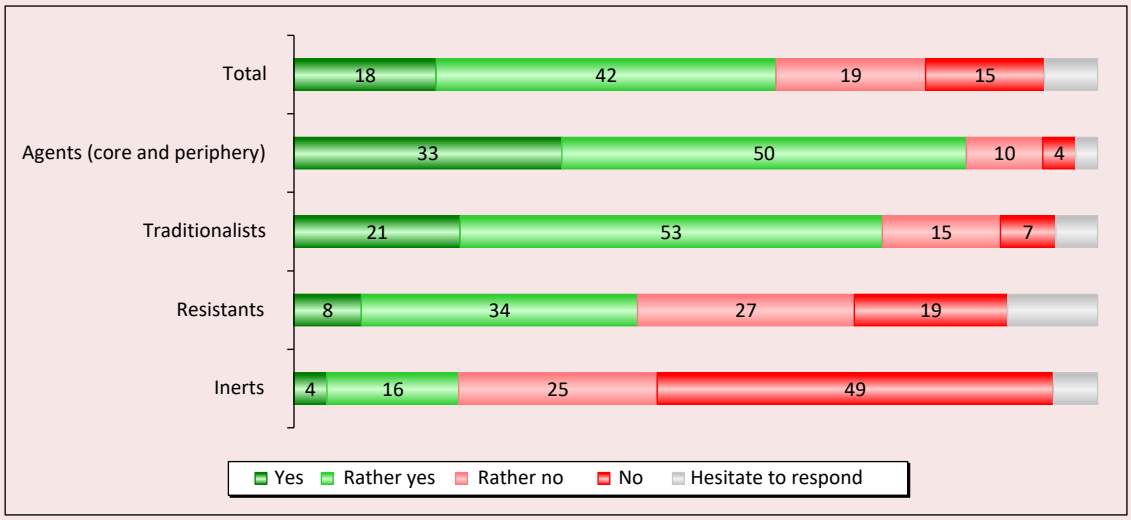


Figure 7. Distribution of answers to the question "Are you ready to unite with other people to equip the territory of residence (house, yard, city)", in the context of the identified population groups, %



The propensity for collective action and a high responsibility level for what is happening around are confirmed by real practices of social participation, active social activity; 68% of agents of change over the previous year or two have taken a real part in the territory's improvement. For comparison: among all residents of the city, only 25% participated in various landscaping practices, among the inert – only 1%; 73% of representatives of the group of agents of social change participate in charitable activities (only 23% among the entire population; *Tab. 2*); 67% helped people gratuitously with money, 63% – with things and products, 23% – in finding a job; 45% of representatives of the core of change agents and 20% of the periphery delivered food, clothing, and medicines to their homes during the COVID-19 pandemic (only 12% of the total population).

Table 2. Distribution of answers to the question "Could you say which of the listed public affairs you have voluntarily and free of charge participated in over the previous year or two?", %

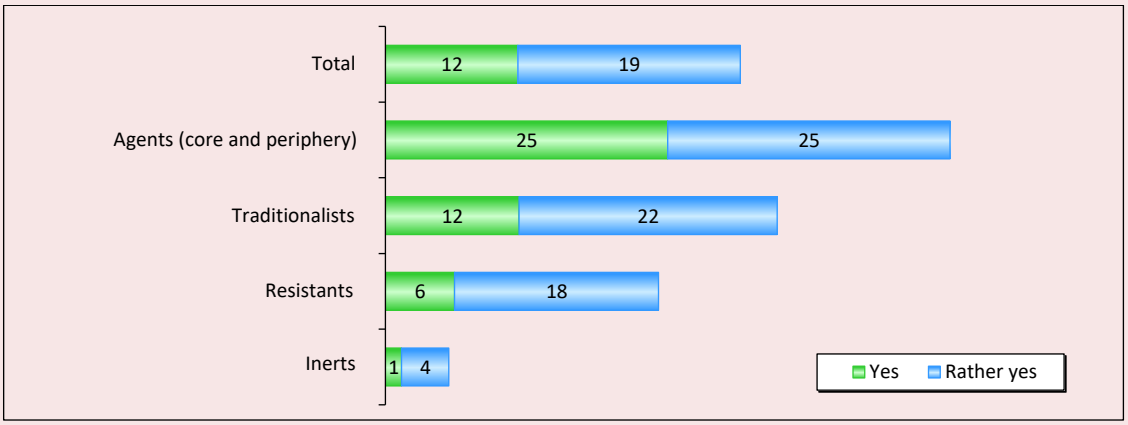
Respond option	For the sample as a whole	Change agents	Traditionalists	Resistants	Inerts
Community service at the place of residence (litter picks, landscaping activities)	25	**68**	27	9	1
Charity events (including cash donations to those in need)	23	**73**	23	7	0
Mass events (city holidays, etc.)	13	**52**	12	2	0
Activities of non-profit organizations, worked as a volunteer, volunteer	7	**37**	5	1	0
Blood donation	6	**22**	6	1	0
Public discussions, actions about social problems including on the Internet	5	**29**	3	1	0
Animal care in shelters, hunting farms, at the racetrack	3	**10**	2	1	0
Public hearings	2	**10**	1	1	0
Search for missing people, the work of search groups	1	**6**	0	0	0
Elimination of the consequences of natural disasters (fire, etc.)	1	**3**	0	1	0
Keeping order (people's squads, etc.)	1	**3**	1	0	0
None of the above	54	**4**	45	78	99
Source: sociological survey results of the population of Cherepovets.					

The level of formal social participation – membership in public organizations and active participation in the actions organized by them – is quite low; 72% of citizens noted that they did not take part in any events. Among the agents of social change, there are significantly fewer of them – 39%. The most active is the participation in the events of parent committees of schools and kindergartens, self-government organizations in the field of housing and communal services, physical culture and sports public organizations.

In this context, it is impossible to ignore another feature of the agents of social change – the tendency to unite in order to defend their rights, to protest against the wrong actions of the authorities. They are ready to support the authorities and become agents of only those changes that correspond to their attitudes and ideas about positive social development.

Those decisions of the authorities that the representatives of the groups consider wrong will be protested. To do this, 50% of the agents of social change are ready to unite. For comparison, answering this question, only 1% of the representatives of the conditionally inert group gave the answer "Yes" and 4% chose the evasive "Rather yes" (*Fig. 8*).

Figure 8. Distribution of answers to the question "Are you ready to unite with other people to protest against the wrong actions of the authorities?" (share of those who answered "Yes" and "Rather yes" in the identified groups), %



Conclusions

The formed indicator model we developed based on the analysis of Russian and foreign theoretical and practical experience can serve as a valid tool for identifying the most active people including measuring the share of agents of social change in the population of a particular city. The heuristic capabilities of the model were confirmed in a mass sociological survey. The research has proved the importance of an integrated approach to the identification of agents of social change, which means the inclusion of both behavioral characteristics and attitudes in the model.

The theoretical part of the article provides a general justification and selection of the values included in the model based on the analysis carried out by Russian and foreign authors of the characteristics of the most active segments of the population in terms of the transformation of social reality as a whole, and in a narrower sense – in terms of those inclined to social participation in its various forms, especially in line with regional, territorial development. We have identified such indicators as the locus of responsibility, the propensity to unite, innovation, initiative, and the adaptation level. They were transformed from theoretical to practical and incorporated into the research tools.

The research results have shown that the population activity level is sufficiently differentiated by its different types, it is impossible to use only one or two behavioral indicators to identify it. Often, the activity level in terms of social participation is determined by membership in formal organizations. However, this approach is not entirely correct. The level of formal participation is low not only in Cherepovets (72% of citizens do not belong to any of the public organizations), but also in Russia and in European countries according to the results of the European social research, and is not objectively measuring the participation level in general. The trend is to shift social activity into informal practices and into everyday life. And their level is significantly higher, already only 54% of residents of the city of Cherepovets have not taken any action within the framework of these practices. Practices of helping behavior are even more widely developed; only 21% of the population is not involved in them. A comparative analysis of the empirical results of our survey and surveys of leading Russian authors on the topic of social activity shows that the all-Russian trends are almost identical to the trends in Cherepovets, especially in terms of the participation level in various forms of social

activity. Consequently, the main patterns identified in our study can be extended to the Russian realities as a whole.

The model is an innovative methodological construct. Unlike most methods of analysis in sociology, when the array as a whole is analyzed and the typology is based on the distribution of responses throughout the sample, here the unit of account is a single respondent. Typologization is carried out by determining the level of social activity and attitudes of each respondent from the empirical base by calculating a common integrated additive index for all included variables. The calculation combines not only ordinal scales, which are quite easily converted into an index, but also nominal multivariate scales which are usually designated as low-order scales and are rarely translated into a numerical index. The algorithm described in detail in the article is an instruction for calculating the level of activity and typologization of the population of any region and can be used by researchers. At the same time, it is unnecessary to adapt it in different regions, the indicators are universal.

The practical significance of the research lies in the interest of small and medium-sized cities in forming the core of active and advanced segments of the population. We have chosen Cherepovets as a research site, a city with a population of a little more than three hundred thousand people, where the production assets of two of the largest Russian companies – Severstal and PhosAgro – are concentrated. One of the main objectives of the development of Cherepovets is the economic diversification. The task was set based on the results of the Cherepovets-2020 Foresight back in 2009–2010, but remains as relevant as ever (Mekhova, 2017). In 2017, Cherepovets received the status of a territory of advanced socio-economic development. Now the city is implementing an updated development strategy – "Cherepovets is a city of opportunities", so Cherepovets really needs creative, socially active people. The research provides the city's leadership and all interested parties with information that allows identifying reserves of motivation for the activity and innovation of urban communities, to develop tools for supporting medium and small businesses, the formation of intellectual spaces, the development of creative industries, which will become a platform for the self-realization of agents of social change and will serve as a driver in the implementation of the city's strategy.

References

Bartal A., Pliskin N., Ravid G. (2019). Modeling influence on posting engagement in online social networks: Beyond neighborhood effects. *Social Networks*, 59, 61–76. Available at: https://doi.org/10.1016/j.socnet.2019.05.005

Batova M.M. (2019). Formation of digital competencies in the system "education – science – production". *Voprosy innovatsionnoi ekonomiki=Russian Journal of Innovation Economics*, 9(4), 1573–1584. DOI: 10.18334/vinec.9.4.41467 (in Russian).

Bekalu M.A., McCloud R.F., Minsky S., Viswanath K. (2020). Association of social participation, perception of neighborhood social cohesion, and social media use with happiness: Evidence of trade-off. *Journal of Community Psychology*. DOI: 10.1002/jcop.22469

Bogdanov V.S., Merzlyakov A.A. (2018). Diagnostics of the potential of social participation in the context of organizing feedback between authorities and population. *Nauchnyi rezul'tat. Sotsiologiya i upravlenie=Research Result. Sociology and Management*, 4, 65–77. DOI: 10.18413/2408-9338-2018-4-4-0-6 (in Russian).

Bourdieu P. (2001). Forms of capital. In: *The Sociology of Economic Life*. 2nd Edition. Boulder: Westview Press.

Bourdieu P. (2002). Forms of capital. *Ekonomicheskaya sotsiologiya=Economic Sociology,* 5, 60–74. Available at: https://ecsoc.hse.ru/data/2011/12/08/1208205039/ecsoc_t3_n5.pdf (in Russian).

Chanda S., Mishra R. (2019). Impact of transition in work status and social participation on cognitive performance among elderly in India. *BMC Geriatrics*, 19(1). DOI: 10.1186/s12877-019-1261-5

Coleman J. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95–120.

Coleman J. (2001). Social and human capital. *Obshchestvennye nauki i sovremennost'=Social Sciences and Contemporary World*, 3, 122–139 (in Russian).

Dezuanni M., Foth M. (2019). *Digital Participation through Social Living Labs. Valuing Local Knowledge, Enhancing Engagement.*

Drozdova Ju.A. (2019). A resource approach towards examining territorial communities. *Vestnik Instituta sotsiologii=Bulletin of the Institute of Sociology,* 10(1), 82–103. DOI: DOI: 10.19181/vis.2019.28.1.557 (in Russian).

Drucker P.F. (1985). *Innovation and Entrepreneurship. Practice and Principles.* New York.

Drucker P.F. (2002). *Zadachi menedzhmenta v XXI veke* [Management Challenges for 21st Century]. Moscow: Vil'yams.

Fagence M. (1977). *Citizen Participation in Planning*. Pergamon.

Florida R. (2002). *The Rise of the Creative Class. And How It's Transforming Work, Leisure and Everyday Life*. Basic Books.

Florida R. (2005). *The Flight of the Creative Class. The New Global Competition for Talent*. HarperBusiness, HarperCollins.

Galitskaya E.G., Galitskii E.B., Petrenko E.S., Rapoport S.A. (2012). The "FOMography" methodology and resource differentiation of Russian society. *Sotsiologicheskie issledovaniya=Sociological Studies*, 10, 131–142 (in Russian).

Guzgavina T., Mekhova A. (2018). Social capital – a factor in region's sustainable development. *European Journal of Sustainable Development*, 7(3), 483–492. DOI: 10.14207/ejsd.2018.v7n3p483

Guzhavina T.A., Afanas'ev D.V., Vorob'eva I.N. et al. (2018). *Regional'nyi sotsial'nyi kapital v usloviyakh krizisa: monografiya* [Regional Social Capital in Crisis: Monograph]. Cherepovets: ChGU.

Guzhavina T.A., Vorobeva I.N. (2018). Interpersonal trust in the structure of social capital. *Voprosy territorial'nogo razvitiya=Territorial Development Issues,* 2(42). DOI: 10.15838/tdi.2018.2.42.5 (in Russian).

Heertje A. (2006). *Schumpeter on the Economics of Innovation and the Development of Capitalism*. Cheltenham: Elgar.

Kirdina S.G. (2003). Social changes. In: *Sotsiologicheskaya entsiklopediya. T. 2* [The Sociological Encyclopedia. Volume 2] (in Russian).

Maslennikova A.Yu., Lapaev S.P. (2012). A high level of creativity as a creativity as a determinant of innovation development of the region. *Vestnik OGU=Vestnik of the Orenburg State University*, 13, 237–243 (in Russian).

McCraw T.K. (2007). *Prophet of Innovation: Joseph Schumpeter and Creative Destruction*. Cambridge Mass.: Harvard University Press.

Mekhova A.A. (2017). Foresight as an innovative forecasting technology and a form of social participation. In: *Navstrechu budushchemu. Prognozirovanie v sotsiologicheskikh issledovaniyakh: mat-ly VII mezhdunar. sotsiol. Grushinskoi konferentsii* [Toward the Future. Forecasting in Sociological Research: Materials of the 7th Grushin International Sociological Conference]. Moscow: VTsIOM (in Russian).

Merzlyakov A.A. (2014). Social participation as an object of sociological analysis. In: *Modernizatsiya otechestvennoi sistemy upravleniya: analiz tendentsii i prognoz razvitiya: mat-ly Vseros. nauchn.-prakt. konf. i XII–XIII Dridzevskikh chtenii* [Modernization of the Russian Management System: Analysis of Trends and Development Forecast: Materials of the All-Russian Scientific-Practical Conference and 12th–13th Dridze Readings]. Moscow: IS RAN (in Russian).

Newton K., Giebler H. (2008). *Patterns of Participation: Political and Social Participation in 22 Nations. Discussion Paper SP IV 2008-201.* Wissenschaftszentrum Berlin für Sozialforschung (WZB).

Nikovskaya L.I., Skalaban I.A. (2017). Civic participation: Features of discourse and actual trends of development. *Polis. Politicheskie issledovaniya=Polis. Political Studies*, 6, 43–60. DOI: 10.17976/jpps/2017.06.04 (in Russian).

Petrenko E.S. (2011). Lifestyle and historical memory of Russians about the events of 1985–1999. *Monitoring obshchestvennogo mneniya: Ekonomicheskie i sotsial'nye peremeny=Monitoring of Public Opinion: Economic and Social Changes Journal (Public Opinion Monitoring)*, 5(105), 73–80 (in Russian).

Pilyasov A.N, Kolesnikova O.Yu. (2008). Evaluation of creativity of the Russian regional communities. *Voprosy ekonomiki*, 9, 50–69. DOI: 10.32609/0042-8736-2008-9-50-69 (in Russian).

Putnam R. (1995). Bowling alone: America's declining social capital. *The Journal of Democracy*, 6(1), 65–78.

Rimskaya O.N., Anokhov I.V., Kranbikhler V.S. (2021). Human capital in industry 4.0. Present and future. *Ekonomika nauki=The Economics of Sciences*, 7(4), 275–289. DOI: 10.22394/2410-132X-2021-7-4-275-289 (in Russian).

Sadovaya E.S., Sautkina V.A., Zenkov A.R. (2019). *Formirovanie novoi sotsial'noi real'nosti: tekhnologicheskie vyzovy* [Formation of a New Social Reality: Technological Challenges]. Moscow: IMEMO RAN. DOI: 10.20542/978-5-9535-0564-2

Schumpeter J. A. (1949). *Theory of Economic Development*. Cambridge, MA: Harvard University Press.

Shkaratan O.I. (2008). A new middle class and information workers on Russian labor market. *Obshchestvennye nauki i sovremennost'=Social Sciences and Contemporary World*, 1, 5–27 (in Russian).

Shkaratan O.I. (2009). *Sotsial'no-ekonomicheskoe neravenstvo i ego vosproizvodstvo v sovremennoi Rossii* [Socio-Economic Inequality and Its Reproduction in Contemporary Russia]. Moscow.

Skalaban I.A. (2011). Social, public and civic participation: The problem of conceptual understanding and misunderstanding. *Vestnik Tomskogo gosudarstvennogo universiteta. Filosofiya. Sotsiologiya. Politologiya=Tomsk State University Journal of Philosophy, Sociology and Political*, 1, 130–139 (in Russian).

Sokolov A.V., Barskiy Ya.V. (2021). Development of civil engagement in Russia in the conditions of digital transformation. *Vestnik Voronezhskogo gosudarstvennogo universiteta. Seriya: Istoriya, politologiya, sotsiologiya=Proceedings of Voronezh State University. Series: History. Political Science. Sociology*, 2, 68–74 (in Russian).

Sztompka P. (1996). *Sotsiologiya sotsial'nykh izmenenii: per. s angl* [The Sociology of Social Change: Translated form English]. Moscow.

Trubitsyn O.K. (2019). Creatosphere development in information society. *Filosofiya i gumanitarnye nauki v informatsionnom obshchestve=Philosophy and Humanities in Information Society*, 2(24), 29–49 (in Russian).

Tsalikova I.K., Pakhotina S.V. (2019). Scientific research on the issue of soft skills development (review of the data in international databases of Scopus, Web of Science). *Obrazovanie i nauka=The Education and Science Journal*, 21(8), 187–207. DOI: 10.17853/1994-5639-2019-7-187-207 (in Russian).

Uvarina N.V., Savchenkov A.V. (2021). Of flexible skills of young people in the conditions of social partnership. *Sovremennaya vysshaya shkola: innovatsionnyi aspekt=Contemporary Higher Education: Innovative Aspects*, 1, 78–85. DOI: 10.7442/2071-9620-2021-13-1-78-85 (in Russian).

Verba S., Nie N., Kim J. (1978). *Participation and Political Equality: A Seven Nation Comparison*. Chicago: University of Chicago Press.

Volkov Yu.G. (2010). Creative class: Search for a sociological concept. *Rossiya reformiruyushchayasya*, 9, 43–60 (in Russian).

Volkov Yu.G. (2013). Creative class as the integrating core of Russian society. *Vestnik Moskovskogo Universiteta. Seriya 18. Sotsiologiya i politologiya=Moscow State University Bulletin. Series 18. Sociology and Political Sciences*, 2, 76–92 (in Russian).

Volkov Yu.G. (2014). Creative class and the Russian state: Prospects and cooperation. *Vlast'=The Authority*, 3, 12–17 (in Russian).

Volkov Yu.G. (2020). New social elevators in the regional space. *Rossiya reformiruyushchayasya*, 18, 131–159. DOI: 10.19181/ezheg.2020.6 (in Russian).

Yadov V.A. (2001). Social resource of individuals and groups as their capital: The possibility of applying a universal methodology for the study of real stratification in Russian society. In: *Kto i kuda stremitsya vesti Rossiyu?* [Who is Trying to Lead Russia and Where?]. Moscow: MVShSEN (in Russian).

Zaytseva A.S. (2021). The impact of digital competencies of small and medium-sized business on business development. *Ekonomika, predprinimatel'stvo i pravo=Journal of Economics, Entrepreneurship and Law*, 11(2), 313–322. DOI: 10.18334/epp.11.2.111640 (in Russian).

Information about the Authors

Irina N. Vorobeva – Candidate of Sciences (Sociology), Associate Professor, Cherepovets State University (8, Sovetsky Avenue, Cherepovets, Vologda Oblast, 162600, Russian Federation; e-mail: Vorobyova-i-n@yandex.ru)

Albina A. Mekhova – Candidate of Sciences (Philosophy), Associate Professor, head of department, Cherepovets State University (8, Sovetsky Avenue, Cherepovets, Vologda Oblast, 162600, Russian Federation; e-mail: albina_mehova@mail.ru)

Received January 24, 2022.

DOI: 10.15838/esc.2022.4.82.13
UDC 316, LBC 60.524

Environmental Threats as a Factor Promoting Environmental Consciousness

Nataliya M.
VELIKAYA
Institute of Socio-Political Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: natalivelikaya@gmail.com
ORCID: 0000-0001-5532-844X; ResearcherID: A-9577-2017

Ol'ga P.
NOVOZHENINA
Institute of Socio-Political Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences Moscow, Russian Federation
Moscow, Russian Federation
e-mail: olganov@mail.ru
ORCID: 0000-0003-3511-0384; ResearcherID: R-5132-2019

Abstract. The article examines changes in environmental consciousness, which depend on how environmental threats are presented and perceived in public opinion and public discourse in Russia. Using the theory of socio-cultural risks and threats, we consider the formation of the so-called environmental paradigm, which interprets environmental consciousness as part of public consciousness. Analyzing the inclusion of the environmental agenda in the domestic public and political discourse, we show show that since the 1990s Russian legislation has been guided by international documents in this area, and the Russian Federation has actively participated in all significant international environmental forums. The attack on the non-profit sector initiated by the state authorities in the 2010s significantly reduced the number of non-governmental organizations in the environmental sphere and affected the content of public discourse. The low level of awareness of the progress and content of the national project "Ecology" indicates insufficient interaction of the Ministry of Natural Resources and Environment of

For citation: Velikaya N.M., Novozhenina O.P. (2022). Environmental threats as a factor promoting environmental consciousness. *Economic and Social Changes: Facts, Trends, Forecast*, 15(4), 209–227. DOI: 10.15838/esc.2022.4.82.13

the Russian Federation with civil society institutions and representatives of local environmental initiatives. As a result, poor involvement of the population in environmental processes can potentially lead to the emergence of occasional environmental protests. The data of sociological studies show that public awareness of environmental threats is growing rather slowly and unevenly. In the overall rating of threats, environmental threats usually rank 3rd–4th, but this has a small effect on environmental behavior and on the formation of nature-saving social practices. We consider promoting environmental consciousness as a process of helping people to become more aware of anthropogenic risks and strive for a healthy ecological environment. The typological group of "responsible" individuals identified on the basis of this approach differs from the group of "indifferent" ones according to a number of socio-demographic and socio-political features and demonstrates weak positive dynamics.

Key words: sustainable development, ecology, environmental consciousness, ecological crisis, national projects, social practices, ecological modernization.

Introduction

Ecological wellbeing and sustainable development actively entered the scientific and public discourse in the second half of the 20th century, when the ecological crisis was recognized as a global problem of human civilization and began to be substantively addressed by the international community, where international organizations and associations played the leading role. The ideas of modern environmentalism were most fully reflected in three landmark publications that influenced the development of the environmental movement worldwide: the Club of Rome report *Limits to Growth* (Meadows et al., 1991), *A Blueprint for Survival* by the editors of The Ecologist with a foreword by the famous biologist Ehrlich, and *Small is beautiful* by Fritz Schumacher (Aksenova, 2006).

In fact, the transition from the anthropocentric to ecocentric paradigm of societal development, where the highest value is the harmonious development of nature and man, began at the 1972 Stockholm UN Conference on the environment, when the link between sustainable development and environmental conservation was defined and a joint plan of action of states was adopted[1]. The UN Conference on Environmental Protection (Earth Summit) in 1992 in Rio de Janeiro adopted the Rio Declaration, which defined the basic principles of international environmental law[2], contributing to the development of environmental legislation in a number of countries.

Attention to environmental problems at the global and subnational level necessitates the creation of special services to protect the environment at the national level as well. In Russia by that time, in 1991, the USSR Ministry of Nature Management and Environment was created.

Putting environmental security at the top of the global agenda led to the adoption of the United Nations Millennium Declaration in 2000, which stated the need to implement the principle of sustainable development. And in 2012, at the UN Conference on Sustainable Development Rio +20, the report *The Future We Want* emphasized the need to integrate the environmental, social and economic dimensions to achieve sustainable development goals in all its directions[3]. Among the most

[1] Report of the United Nations Conference on the Human Environment. Stokholm, 5–16 June 1972. United Nations. New-York, 1973. Available at: https://daccess-ods.un.org/tmp/6735631.22749329.html (accessed: July 12, 2022).

[2] Rio Declaration on Environment and Development. Adopted by the United Nations Conference on Environment and Development, Rio de Janeiro, June 3–14, 1992. Available at: https://www.un.org/ru/documents/decl_conv/declarations/riodecl.shtml (accessed: July 12, 2022).

[3] Rio+20. United Nations Conference on Sustainable Development. Rio de Janeiro, Brazil, June 20–22, 2012. Available at: https://www.un.org/ru/events/pastevents/rio20.shtml (accessed: July 12, 2022).

significant documents where ecology is a priority, let us mention the 2015 UN report Transforming Our World: The 2030 Agenda for Sustainable Development[4], as well as a package of programs for the 2019 Decade of Action to Achieve the Global Sustainable Development Goals by 2030[5].

Such active inclusion of ecological problems in the political discourse of our time led to the formation of special branches at the junction of ecology and other sciences: political ecology (Wolf, 1972), social ecology (Losev, 1998; Deryabo, 1999; Panov, 2004), and also caused research interest in issues of interpretation and general assessment of environmental risks and threats (Gladun et al, 2021; Maslova, 2022), problems of formation of ecological consciousness (Shumeiko, 2003; Oreshkina, 2014; Gordin, Ryumina, 2021; Kozlovskii et al., 2022).

In the development of the "new ecological paradigm" (Catton, Dunlap, 1978; Dunlap, Catton, 1994) Russian scientists made a significant contribution, laying the foundations of modern ideas about the specifics of the interaction between society and the natural environment (Bondarev, 2010; Babkin, 2014; Yanitskii, 2014) as well as the sustainable development of territories (Voronov, Narbut, 2013; Shushkova et al., 2017). Additionally, it makes sense to mention those works that emphasized a consumerist, eco-phobic system of values in Russia, which led to disastrous consequences in the reproduction of the natural environment (Oreshkina, Konyashkin, 2018) and ineffective systems of civil society pressure on business and government structures (Efremenko, 2006).

The task of studying the awareness and involvement of citizens in the statement and solution of environmental problems has been repeatedly raised by Russian sociologists. Here we note a number of VCIOM studies: monitoring of the ecological situation in general[6] and problems of air pollution and garbage dumps[7], survey conducted in 2021 specially for the Environmental Forum of the Russian Union of Industrialists and Entrepreneurs (RSPP), during which respondents evaluated the environmental situation in their region, in Russia and around the world[8]. The study of Russian citizens' assessments of the environmental situation in their areas of residence, the criteria for a favorable environmental situation and awareness of the national project "Ecology" was also conducted in the course of a nationwide survey of the population by the Analytical Center of the National Agency for Financial Research (NAFI)[9].

The results of studies show the low level of environmental literacy, low awareness of citizens about environmental risks, the growing interest in environmental problems in conditions of environmental disadvantage, but do not allow assessing fully the changes in public awareness, affecting the behavior and the formation of new social practices, including in the sphere of environment-friendly behavior.

[4] Resolution adopted by the General Assembly on September 25, 2015. Transforming our world: The 2030 Agenda for Sustainable Development. Available at: https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=R (accessed: July 12, 2022).

[5] Decade of Action. Available at: https://www.un.org/sustainabledevelopment/ru/decade-of-action/ (accessed: July 12, 2022).

[6] Ecological situation in Russia: Monitoring. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/ekologicheskaya-situacziya-v-rossii-monitoring (accessed: July 15, 2022).

[7] The environmental situation and garbage disposal: Monitoring. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/ekologicheskaya-situacziya-i-vyvoz-musora-monitoring (accessed: July 15, 2022).

[8] The biggest harm to the environment comes from garbage and vehicles... Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/samyi-bolshoi-vred-ehkologii-nanosjat-musor-i-transport-trete-mesto-deljat-promyshlennost-i-lesozagotovki (accessed: July 15, 2022).

[9] Clean air, water and soil are the three pillars of good ecology according to Russians. Available at: https://nafi.ru/analytics/chistye-vozdukh-voda-i-pochva-tri-kita-khoroshey-ekologii-po-mneniyu-rossiyan/ (accessed: July 15, 2022).

Following the logic of W. Beck and K. Kropp, who focus their attention on the features of social construction of environmental risks (Beck, Kropp, 2007), we intend to consider the dynamics of subjective perceptions of society regarding the environmental situation in the country, as well as the environmental risks and threats that are realized and articulated in the public consciousness and public discourse and that shape certain social practices.

The theoretical and methodological basis of the study is the theory of socio-cultural threats and risks (Beck, 2010), according to which environmental hazards and their impact on social processes act as a clear threat to the existence of modern society on a global level. In this logic, we interpret the ecological crisis as a manifestation of ecological risk (Mol, 1995), which could potentially turn into a threat. Understood by threats as a violation of the normative order in the sphere of social interactions, we consider environmental problems, environmental disadvantage as a social threat, potentially dangerous to the state and society.

We share M. Bookchin's view that "almost all of our contemporary ecological problems stem from entrenched social problems ... these ecological problems cannot be understood, let alone solved, without a careful understanding of our contemporary society and the illogic that dominates it" (Bookchin, 1996; Bookchin, 1993).

In turn, we operationalize ecological consciousness, which becomes exclusively social, based on the reflection of social needs and interests (Ashkhamaf, 2010; Berkut, 2010), through the values and norms that individuals follow in their daily lives. In this sense, the term "ecologization of consciousness" in the title of the article implies not only an increased awareness of the presence of environmental threats and the degree of risks, but also joint activities to overcome these threats, mastering certain social practices.

The empirical basis of the work includes the data of the All-Russian sociological monitoring "How do you live, Russia?"[10] and the sociological survey "Political Culture of Russian Society..."[11] (ISPR FCTAS RAS), the data of quantitative-qualitative content analysis of the media, conducted as part of the study "Features of the representation of socio-cultural threats in the Russian mass media" (sociological department of the Russian State University for the Humanities)[12].

[10] Sociological monitoring "How do you live, Russia?" has been conducted by the Center for Social and Socio-Political Studies of ISPR FCTAS RAS since 1992. The research supervisor is V.K. Levashov, Doctor of Sciences (Sociology). The study used a quota-proportional all-Russian sample with interdependent characteristics of the general population: gender, age, education, and place of residence. The territorial location of the sample was based on the economic and geographic zoning of the country while respecting the proportion of the population and the proportion between the urban and rural populations. The sample size at various stages was 1,312–1,866 respondents. The empirical object of the study was the adult population of Russia. By May 2022, 51 stages of the monitoring were conducted.

[11] Sociological research "Political culture of the Russian society in the context of transition to a new technological mode and implementation of Presidential Decree 204 "On national goals and strategic objectives of development of the Russian Federation for the period through to 2024", dated May 7, 2018" was conducted by the Center for Social and Socio-Political Studies of ISPR FCTAS RAS in May – June 2019. The empirical object of the study was the adult population of Russia. The study used a quota-proportional all-Russian sample with interdependent characteristics of the general population: gender, age, education, and place of residence. The territorial location of the sample was based on the economic and geographic zoning of the country, while respecting the proportion of population and the proportion between urban and rural populations. The sample size was 1,800 respondents. The research supervisor was V.K. Levashov, Doctor of Sciences (Sociology).

[12] As part of a content analysis of publications in the media on environmental issues for 2012, 2015 and 2019 (January–September), 1,139 publications were included in the analysis from the primary sample of 1,357 sources in the newspapers *Komsomolskaya Pravda, Moskovskij Komsomolets* and *Rossiyskaya Gazeta*, because some articles did not contain an informative component. Only the print versions of particular leading media outlets were processed, since newspaper websites often contain materials that, for various reasons, are not published in the paper pages. Data collection methods: quantitative and qualitative content analysis of articles posted in the information space of the Russian Federation. Time interval: the sample includes publications from January to September 2012, 2015 and 2019.

Environmental issues are considered throughout the monitoring study "How do you live, Russia?" in the context of assessing the level of anxiety about the state of the environment, the maturity of environmental awareness, the readiness of civil society and individual citizens to take concrete measures to protect nature, etc. After the adoption and launch of the national goals and development projects of the Russian Federation, new blocks of questions were included in the monitoring set of tools, which allowed assessing the level of awareness of citizens about the objectives, progress of the project "Ecology" and the opportunities created within its framework.

The research instrument "Political culture of the Russian society..." allowed clarifying and specifying the monitoring data. We received answers to the questions about how the environmental situation in the place of residence of the respondents has changed over the past 5 years, the possibility of aggravation of which problems in the field of ecology is of the greatest concern.

In conducting a quantitative and qualitative content analysis, we selected three periodicals reflecting different perspectives on the processes taking place in Russia and the world: *Komsomolskaya Pravda* and *Komsomolskaya Pravda. Tolstushka*; *Moskovskij Komsomolets*; *Rossiyskaya Gazeta* and *Rossiyskaya Gazeta. Week*. The criterion for the selection of the media were their national importance, the breadth of the audience, and the circulation of the publications. In addition, we considered publication diversity: *Komsomolskaya Pravda* is a conservative-populist source, *Moskovskij Komsomolets* is a liberal-populist source, and *Rossiyskaya Gazeta* reflects the official point of view on processes taking place in Russia and the world. The study identified the features of the reflection of real and possible environmental threats and risks in the media, which allowed identifying clusters of environmental problems presented in the information space.

Ecology in Russian politics and public discourse

The ecological factor as one of the grounds for sustainable development is assessed and interpreted differently at the national level, within the framework of public policies of different countries. Basic documents on sustainable development, including the 2030 Agenda for Sustainable Development, were signed on September 25, 2015, but countries that have made global commitments are developing and funding their own sustainable development strategies, plans, and programs.

Unfortunately, the Environmental Security Strategy of the Russian Federation, while emphasizing the external threats to environmental security (p. 21), does not clearly formulate the content of internal threats[13]. Experts in this field distinguish two groups of threats: those caused by human activities in the industrial and economic spheres (e.g., diminishing stocks of various natural resources or unproductive use of natural resources) and those associated with illegal manifestations in the actions of certain individuals and groups (e.g., overuse of natural resources or poaching) (Vorontsov et al., 2017).

Ecological modernization, which in this case is the basis of socio-economic changes, involves the rejection of a utilitarian, anthropocentric attitude to the environment (Kulyasov, 2005). In the Russian Federation, the national set of indicators of sustainable development goals[14] is largely focused on environmental issues. The goals of sustainable development largely determine the content of the national project "Ecology"[15], which suggests the implementation of such tasks as environmental protection, waste management and recycling,

[13] "On the environmental security strategy of the Russian Federation until 2025": Presidential Decree 176, dated April 19, 2017. Available at: http://www.kremlin.ru/acts/bank/41879 (accessed: July 15, 2022).

[14] National set of SDG indicators. Available at: https://rosstat.gov.ru/sdg/national (accessed: July 15, 2022).

[15] Passport of the national project "Ecology". Available at: https://www.mnr.gov.ru/upload/medialibrary/0bd/NP_EkologiyaPasport.pdf (accessed: July 16, 2022).

preserving water bodies and improving the quality of drinking water, reducing air pollution, nature and animal protection, the introduction of the best environmental technologies. Unfortunately, the national project "Ecology" and the federal projects included in it showed the worst results in terms of cash execution in the first quarter of 2022. As of April 1, out of the 117.1 billion rubles allocated in 2022, 8.2% of the planned funds (9.5 billion) had been allocated for implementation. In the second quarter the result was better: 35.5% of the allocated 128.3 billion rubles was spent on implementation (45.5 billion), and the ninth place out of 14 in terms of the level of funds use *(Tab. 1)*.

The formation of the environmental agenda depends on different actors, both state and non-state. The adoption of the law on "foreign agents" caused a significant decrease in the number of non-profit organizations (NPOs) dealing with environmental issues in 2012–2015 (Kefner, Morgun, 2020). E.A. Topoleva-Soldunova, chairman of the Commission for Development of the Non-Profit Sector and Support of Socially Oriented NPOs of the RF Civic Chamber, speaking about environmental organizations, noted: "...This is not a priority area for state support. International foundations used to be a good support in this sphere. There is no Russian substitute for them yet"[16]. The reduction in the number of NPOs in the field of environmental protection becomes a kind of brake on the development of a green economy, since there is no effective public control over the activities of both government and for-profit structures, as well as large industrial monopolies (Tsepilova, 2019).

In this regard, we agree with those colleagues who believe that environmental issues lag far behind socio-economic and political issues in terms of priority (Velikaya, 2019; Rastorguev, 2022), while in the political public space they have always been relegated to the periphery, which was explained by the urgent need to solve economic and social problems. Attempts to incorporate the environmental agenda into the official discourse have resulted in declarative goals and objectives and, as a result, weak public participation in environmental projects.

Table 1. Cash execution of federal projects that are part of the national project "Ecology"

Federal project	1st quarter of 2022			2nd quarter of 2022		
	Allocated, billion rubles	Transferred		Allocated, billion rubles	Transferred	
		billion rubles	%		Billion rubles	%
Conservation of biodiversity and the development of ecological tourism	1.1	0.4	35.0	1.1	0.7	64.4
Conservation of unique water bodies	2.7	0.6	22.6	3.0	1.0	34.0
Forest conservation	5.3	1.1	20.6	5.4	3.4	62.1
Clean air	11.3	1.1	9.6	11.7	3.5	29.7
Restoration of the Volga	24.2	2.2	9.1	25.3	8.3	32.9
Conservation of Lake Baikal	9.2	0.8	9.0	8.1	1.8	21.9
Clean country	39.3	2.9	7.5	37.0	18.5	49.8
Integrated system of solid municipal waste management	17.6	0.4	2.2	26.3	2.7	10.3
Infrastructure for hazard classes I–II waste management	5.7	-	0	10.4	5.7	54.8

Source: Execution of federal budget expenditures on the implementation of national projects. Available at: https://minfin.gov.ru/common/upload/press_center/2022/04/01_04_22.xlsx; https://minfin.gov.ru/common/upload/press_center/2022/07/01_07_2022.xlsx (accessed: July 15, 2022).

[16] The number of patriotic and sports NPOs is growing in Russia. Available at: https://iz.ru/news/677126 (accessed: July 17, 2022).

Public inattention to the topic of ecology did not allow a "green" political party with a noticeable political weight to gain a foothold in the Russian political space. Thus, two environmental parties participated in the 2021 elections: the Russian environmental party "The Greens", registered back in 2012, and the new party "Green Alternative", registered in 2020. The overall result of both parties in the elections did not reach 2%, which does not allow us to hope for a successful environmental project in the field of Russian politics in the near future. The environmental component of the electoral programs of most political parties participating in the 2021 elections is represented in a limited way, as a rule, it was discussed in the context of other instrumental tasks (Rastorguev, 2022). While the programs of the parties "United Russia", "A Just Russia" and "Yabloko" included separate sections on ecology, the programs of other political parties (Civic Platform, Party of Growth, Russian Party of Pensioners for Social Justice) do not address environmental issues at all.

At the same time, environmental threats are represented in the media in their entirety and cover a wide range of existing risks and dangers related to the environment. However, in the overall rating of threats represented in the media, it is one of the last in terms of the volume of the text corpus. According to the results of the content analysis of the media for 2012, 2015 and 2019, among the publications directly related to environmental issues, we were able to identify the main clusters by threats most frequently mentioned in the media, namely:

- harmful air emissions, air pollution, traffic emissions, etc. (139 publications for the entire period);
- conservation of forests and green spaces – illegal logging, forest fires, peatlands, bark beetles, snags, etc. (138 publications);
- collection, accumulation, storage, sorting, recycling and disposal of waste and garbage (121 publications);
- pollution of waters of the world ocean, rivers, lakes, groundwater, drinking water sources, reduction of water resources, shoaling of water bodies, conservation of unique water systems (Lake Baikal, the Volga), wastewater and operation of sewage treatment plants (108 publications);
- compliance of enterprises and their products with environmental standards and norms of environmental safety – environmental impact, reduction of harmful emissions, etc. (67 publications);
- climate change issues – global warming, melting of glaciers, global sea level rise, greenhouse effect, ozone layer depletion (62 publications);
- reduction of bioresources and biodiversity, disruption/destruction of complex ecosystems (34 publications);
- soil pollution, subsoil management (34 publications);
- issues of nuclear power, development of the peaceful atom, radiation (accidents at nuclear power plants, their consequences, etc.), and disposals of radioactive waste (22 publications);
- development of electric power and alternative energy sources, energy saving, utilization of electric power sources (19 publications).

Publications belonging to the above clusters form an idea of ecology as a "problem", a "risk factor", and a "source of threats". The most urgent problems appear to be forest conservation (addressed in 19% of all publications), air pollution (19%), waste management (16%), and water pollution (15%). At the same time, the most frequent topics of forest vegetation, air and water pollution were raised in 2012, and the waste problem – in 2019. In the studied period (2012–2019), the increase in relevance is characteristic only for the topic of waste disposal. The number of publications related to the waste threat has increased significantly, from 6% in 2012 to 28% in 2019. The most tangible drop in relevance during the study period was recorded for threats to the conservation of forests and green spaces: from 25%

in 2012 to 14% in 2019; compliance of businesses with environmental safety standards – 12% in 2012, 9% in 2015, 7% in 2019; soil pollution – 7% in 2012, 6% in 2015, 2% in 2019.

In the total volume of publications since 2019 there have been articles related to the adoption and implementation of the national project "Ecology", but there were no more than 20 of them. We should say that even now the level of awareness of citizens about this project does not inspire much optimism. According to our research, in 2020 only 1.7% of respondents were fully informed about the national project "Ecology"; 16.5% were partially informed; and a half (51%) had no information about the project at all (Levashov, 2020).

The fact that Russian society is still insufficiently informed about the tasks and results of the implementation of the national project "Ecology" was noted in the expert report on the three years of implementation of the project (from 2019 to 2021), presented at the meeting of the Public Council under the Ministry of Natural Resources and Environment of Russia, March 24, 2022. According to experts, it is necessary to "organize a large-scale public discussion of the national project activities with coverage in the federal media"[17].

Assessing the importance of national projects for Russian society as a whole, in 2021 the majority of citizens considered "Healthcare" (78%) and "Education" (70%) to be the highest priority among them. The project "Ecology" came in third place, as 64% of respondents considered it significant for Russian society *(Tab. 2)*.

It is worth noting that the project "Ecology" has consistently ranked third in the hierarchy of evaluations of the national projects' importance both personally for respondents and for Russian society as a whole for the past three years. In 2020, the project was in fourth place according to its importance for the entire society, but the share of respondents who named it was the highest for all years (74%).

Table 2. Distribution of responses to the question "What national projects, in your opinion, are the most important?", % of the respondents (RF, answers ranked by the column "For Russian society as a whole, 2021")

National project	For you personally			For Russian society a whole		
	2019	2020	2021	2019	2020	2021
Healthcare	84	80	76	82	87	78
Education	46	45	62	81	78	70
Ecology	**48**	**49**	**55**	**72**	**74**	**64**
Housing and urban environment	59	47	55	67	62	54
Culture	12	21	41	61	54	47
Science	22	18	33	57	62	44
Labor productivity and employment support	29	31	31	60	56	44
Safe and quality roads	47	58	46	66	76	43
Demography	13	14	21	52	63	34
Small and medium entrepreneurship	18	18	28	38	54	33
Digital economy of the Russian Federation	11	20	11	53	50	21
A comprehensive plan for the modernization and expansion of backbone infrastructure	4	4	9	38	27	18
International cooperation and export	2	5	6	28	30	13
Source: data from the Center for social and socio-political research ISPR FCTAS RAS; (Levashov, 2020; Levashov et al., 2021).						

[17] The national project "Ecology" will be brought closer to the people. *Vedomosti. Ecology.* March 24, 2022. Available at: https://www.vedomosti.ru/ecology/national_projects/articles/2022/03/24/915083-natsproekt-ekologiya-priblizyat-k-narodu (accessed: May 16, 2022).

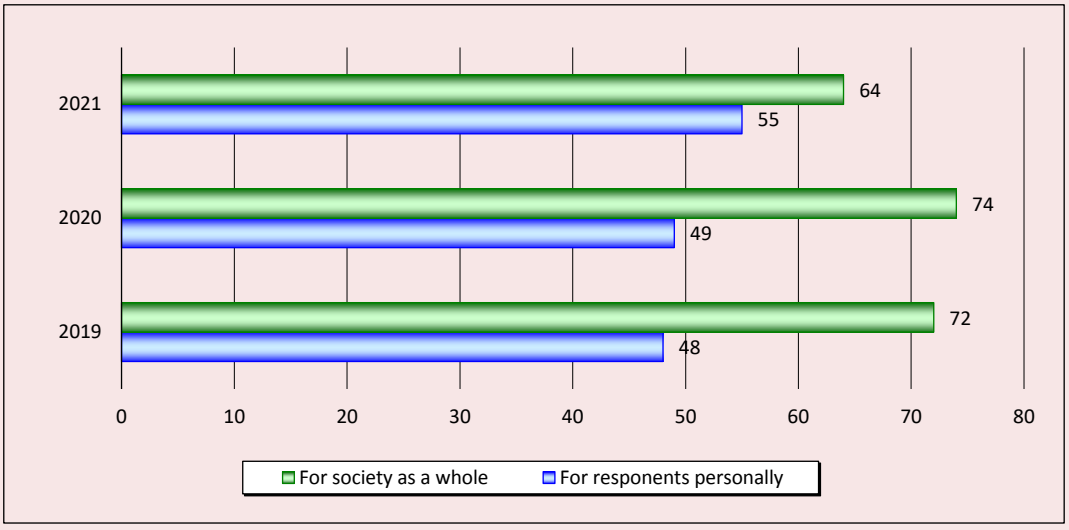
Analysis of the assessment dynamics of the importance of the national project "Ecology" allows drawing a number of conclusions. First, according to citizens, the importance of the project for the entire society, while remaining high, is still decreasing (from 72% in 2019 to 64% in 2021, an increase of 2 percentage points in 2020 is within sampling error). Such a picture is characteristic of the evaluation of all the national projects without exception. It is likely that the topic of the national projects itself is gradually replaced from the public information field by other actualized problems (the coronavirus, sanctions, etc.).

Second, the importance of the project "Ecology" personally for citizens during the same period increased from 48% to 55%. It can be assumed that citizens are increasingly aware of the "green" agenda's importance for improving the quality of life at the household level *(Fig. 1)*.

The current economic and political situation associated with the implementation of a special military operation, has necessitated the adjustment of targets and funding norms for virtually all national projects, including environmental projects.

The worsening of relations with Western countries after the start of the special military operation in Ukraine caused a review of the country's environmental commitments. On April 21, 2022, the chairman of the Supreme Council of the United Russia party published a text in *Rossiyskaya Gazeta* in which he spoke against the so-called ESG agenda, linking environmental, social policy and governance issues, calling it a provocation "in which ecology serves only as a locomotive to promote "democratic" rules, standards and liberal "values" ... We no longer need to align our values with those of the West, we do not need to bring them closer together, we do not even need to compare them. We only need to have an aligned information field with our "partners". And to live and act in a way that is good for our citizens!"[18]. According to the politician, following the green agenda, the

Figure 1. Assessment dynamics of the importance of the project "Ecology", 2019–2021 (RF), % of respondents



Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS; (Levashov, 2020; Levashov et al., 2021).

[18] Boris Gryzlov – about environmental sovereignty of Russia. *Rossiyskaya Gazeta*, federal issue no. 13. Available at: https://rg.ru/2022/01/21/boris-gryzlov-ob-ekologicheskom-suverenitete-rossii.html (accessed: July 16, 2022).

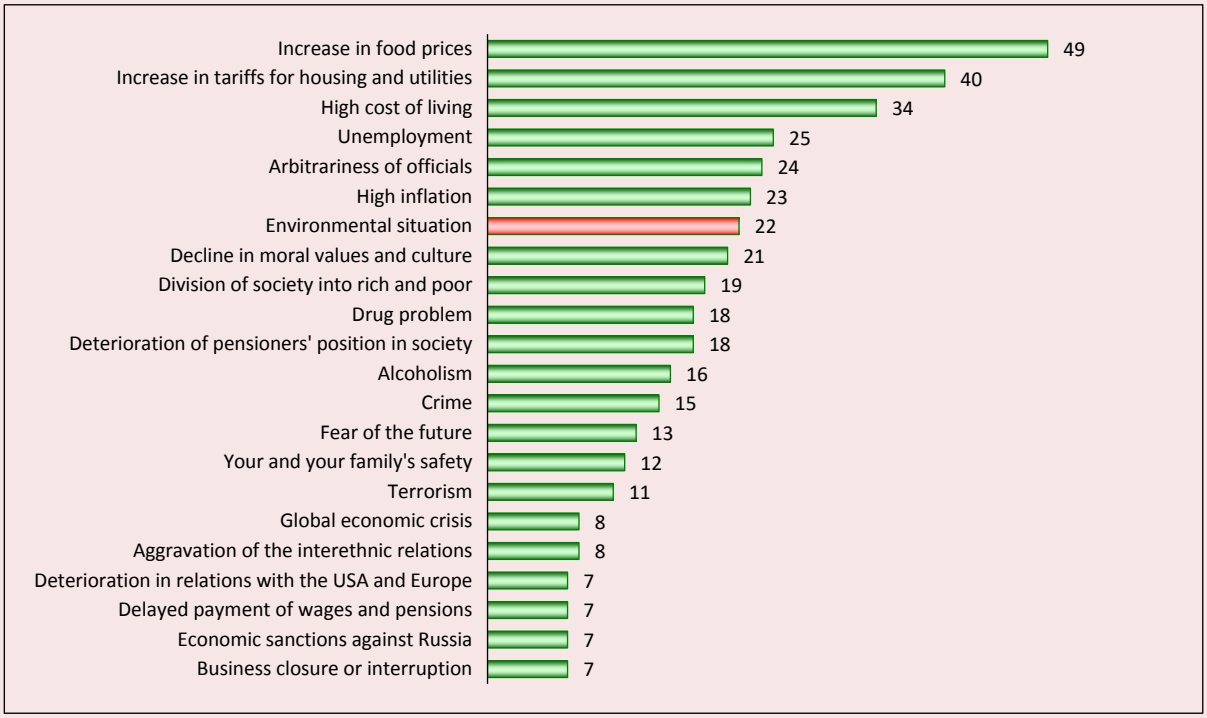
formation of a green economy, and compliance with signed commitments is becoming disadvantageous for citizens. It is obvious that behind these words and meanings are those interest groups that benefit from the exploitation of natural resources without regard to environmental legislation and the country's international obligations, which can now be neglected.

In particular, LUKOIL, like other major oil companies, is experiencing serious problems with fuel shipments under tough sanctions, which threatens to reduce production and shut down refineries. To avoid this, the company wants to redirect the excess fuel oil to CHP and proposes to temporarily abolish high fines for negative environmental impact. The same kind of allowances are needed for the burning of associated petroleum gas, which, according to representatives of LUKOIL, may increase due to the temporary impossibility of selling abroad the liquefied petroleum gases (LPG) produced from it.

These measures actually threaten to abandon the "green transition" policy, create additional environmental risks, and reduce spending on federal projects under the national project "Ecology". A possible return to the use of fuel oil would actually negate the meaning of the federal project "Clean Air" [19]. In the long term, the abandonment of a number of enterprises from green projects will not benefit the Russian economy as a whole.

Time will tell whether these innovations will be actively discussed in the information space and whether they will provoke a negative reaction from civil society.

Figure 2. Anxiety structure of respondents (distribution of responses to the question "What problems worry you most of all?"), 2021, RF, % of respondents



Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS.

[19] The federal project "Clean Air". Available at: https://www.mnr.gov.ru/activity/clean-air/ (accessed: July 16, 2022).

Public opinion on environmental risks and threats

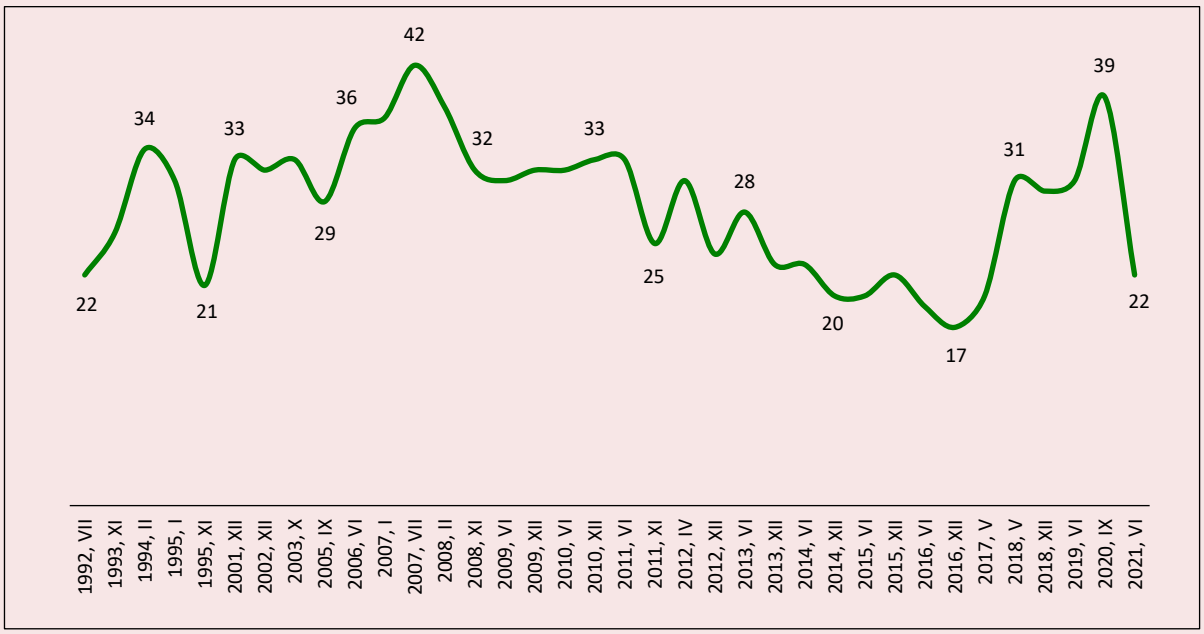
Obviously, the solution to any problem, no matter how brilliant its substantiation and elaboration at the level of political decision-making, is impossible without an existing public consensus.

In proposing a review of the evolution of social perceptions regarding various facets of the current environmental agenda, we assume that in today's high-tech society the prospects for security and sustainable development are linked to threats and risks arising in the sociocultural sphere no less than to threats of a military or man-made nature. In the context of our study, the transformation of the system of values associated with a consumer attitude toward the environment into a system of values oriented toward sustainable development is determinative.

The indicators included in the monitoring set of tools "How do you live, Russia?" allow revealing the levels and structure of respondents' anxiety. Environmental problems are the second most important group of fears, after the fears of the economic order: reduction of income, loss of work, inability to provide a decent life for the family, etc. *(Fig. 2)*.

In particular, in June 2021, the level and structure of anxiety among Russian citizens were determined by a number of interrelated factors that have emerged over the past 2–3 years. The influence of such factors as the global economic crisis, the tense epidemiological situation, and the explosive growth of the introduction of digital technology have increased the already traditional concerns of Russian society not only about the financial situation and the infringement of the interests of the most vulnerable (pensioners, low-wage workers, etc.), but also about the environmental situation. Environmental risks are usually among the top five in the overall ranking of the most significant concerns of citizens. The greatest concern about the

Figure 3. Dynamics of respondents' anxiety about the environmental situation, RF, % of respondents



Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS.

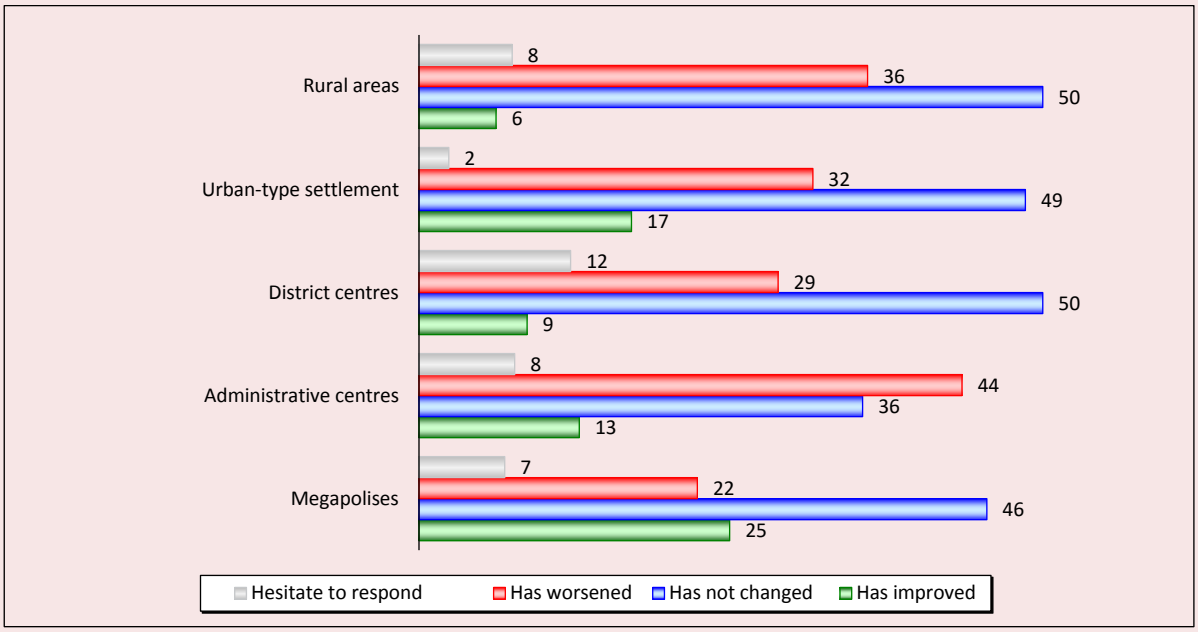
environmental situation during the entire period of observation was noted in 2007–2008 (37–42% of respondents). Then it dropped to 17–20% in 2014–2017 and increased sharply again to 39% in 2020. On average, according to the sociological monitoring "How do you live, Russia?" for the entire period of observation, about a third of respondents expressed concern about the environmental situation *(Fig. 3)*.

Remarkably, the all-Russian sample does not show any significant differences in responses by age. One-third of those surveyed (34% of young people and 30% of the older generation) perceived environmental degradation as a threat.

But there are obvious territorial differences related to the respondents' place of residence. Our research shows that environmental problems are most acute in regional centers, small and medium-sized cities of Russia, and especially in the capitals of the constituent entities of the Federation, where the majority of respondents notice a deteriorating environmental situation *(Fig. 4)*. Indeed, the number of rather acute confrontations between civil society and the authorities over environmental problems has occurred in recent years in the Moscow Oblast, Saint Petersburg and the Leningrad Oblast, the Chelyabinsk, Arkhangelsk, Kemerovo, Tyumen, Volgograd oblasts, Khabarovsk Krai, and others.

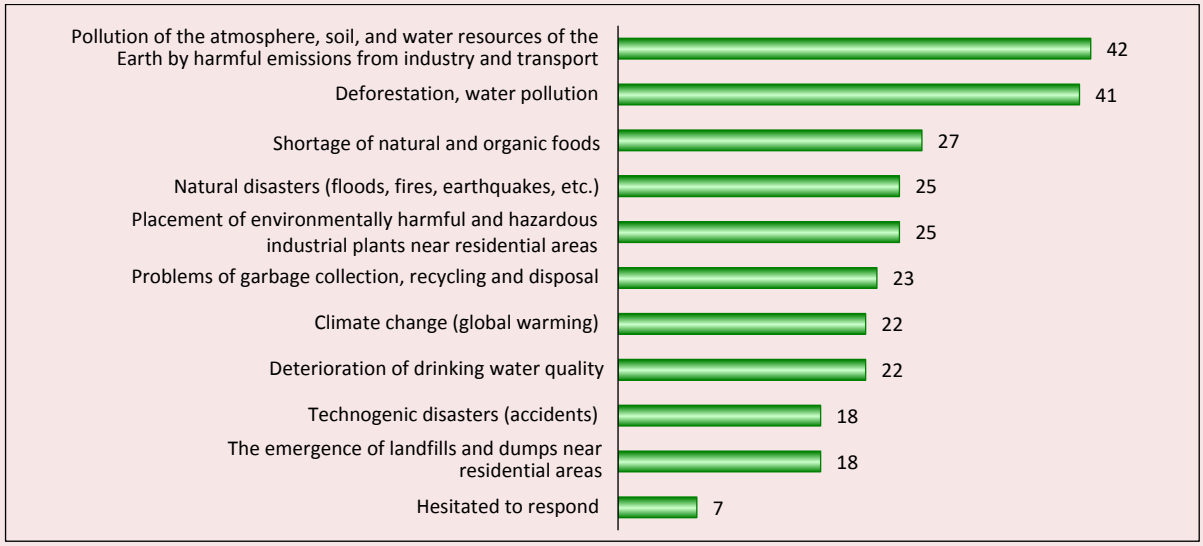
The environmental problems that worry Russian citizens can be conditionally divided into natural and anthropogenic ones according to their genesis. The data presented allow concluding that the possibility of aggravation of anthropogenic, in particular man-made, problems causes the greatest anxiety among the respondents. The possibility of threats associated with the pollution of the atmosphere, soil, and water resources of the Earth by harmful emissions from industry and transport, deforestation, and the pollution of water bodies is of concern to 40% or more of citizens *(Fig. 5)*.

Figure 4. Opinion of residents of different types of settlements on how the environmental situation in their place of residence has changed over the past 5 years, 2019, RF, % of respondents



Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS.

Figure 5. Distribution of respondents' answers to the question "Which of the following problems are you most worried about?", RF, December 2020, % of respondents (N = 1563)



Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS.

A quarter of the surveyed citizens fear the placement of environmentally harmful and hazardous industries near residential areas (25%), as well as problems associated with the collection, recycling and disposal of waste (23%). Every fifth person expresses concern about the appearance of garbage dumps and landfills near residential areas (18%), which correlates with the results of the NAFI study mentioned above, where "respondents who consider the environmental situation in their settlement to be unfavorable primarily complain about the large amount of garbage and landfills (58%)"[20].

Accidents and man-made disasters are of concern to 18% of citizens – a significant figure, but incomparably less than the concerns associated with direct industrial activity and the activities of the population. Besides, anthropogenic problems are closely connected with deficit of natural and ecologically clean food (27%) and deterioration of drinking water quality (22%), which are to a great extent caused by human activity. Threat of increase of natural disasters (floods, fires, earthquakes, etc.) alarms 25% of respondents, dangers related to climate change (global warming) – 22%.

Undoubtedly, all these fears have an objective basis. According to Rosstat, the rate of depreciation of fixed assets of enterprises in 2020 was over 60%, the wear and tear of vehicles – about 50%[21]. Untimely replacement of production assets remains the root cause of the growth of technogenic threats – pollution of the atmosphere, soil and water by harmful emissions. Although there are currently requirements for industrial and agricultural enterprises and fuel producers to ensure the environmental safety of production, they are not always met in full. In 2020, in order to compensate for the losses, companies began to save on environmental measures and suspended the modernization of machinery and equipment.

[20] Clean air, water and soil are the three pillars of good ecology according to Russians. Available at: https://nafi.ru/analytics/chistye-vozdukh-voda-i-pochva-tri-kita-khoroshey-ekologii-po-mneniyu-rossiyan/ (accessed: July 15, 2022).

[21] Fixed assets according to Rosstat (Tab. degree of depreciation). Available at: https://rosinfostat.ru/osnovnye-fondy/#i-5 (accessed: July 16, 2022).

Over the past several years, uncontrolled clearance has resulted in the reduction of forested areas, leading to the narrowing of bird and animal habitats and the destruction of unique plant species. In addition, the expansion of human settlements, construction of transportation routes, and forest fires pose a threat to forests. The reforestation occurs at a much slower pace than its clearing. Solving most of the environmental problems of a man-made nature rests in the interests of the owners of economic entities. In the context of the market economy, especially during an economic crisis, the high priority task of the owners is to preserve and increase profits, which forces to save even more money on environmental compliance.

Ecological consciousness and its carriers

Ecological wellbeing is directly related to the ecological awareness, the assimilation of certain social norms. Our data show that changes in public consciousness in the sphere of the environment-friendly practices are occurring, but at slow pace (*Tab. 3*).

Significantly increased the number of respondents showing that they are ready to sort waste and deliver it to special collection points, but most practices are related to the need to reduce daily consumption: the number of those who save water, gas, electricity, buy energy-saving goods has increased by almost 10 percentage points[22] (Levashov, 2020).

Obviously, the Russian citizens have a growing awareness that the current excessive consumption of natural resources and minerals by the world's population and the consumerist attitude toward the environment comes at the expense and to the detriment of future generations. The number of those who agree with this statement, who we can conventionally call "responsible for the future", has increased by 8 percentage points since 2014, reaching half of the total number of respondents. The number of those who disagreed decreased by 6 percentage points. However, a third of the respondents did not define their position on this issue *(Tab. 4)*.

Those who feel responsible toward future generations (we will name this group "the responsible") are mainly concerned about anthropogenic problems *(Fig. 6)*: deforestation, water pollution (difference of 22 percentage points), problems of collection, processing and disposal of waste (difference of 16 percentage points), placement of ecologically harmful and hazardous industrial enterprises near residential areas (difference of 14 percentage points), and natural disasters (difference of 14 percentage points).

Table 3. Distribution of responses to the question "Among the following, what are you doing to protect nature?", RF, % of respondents

Respond option	2014, V	2020, XII
I try to toss the garbage only in designated areas	82	80
I pick up litter after a nature trip	59	67
I participate in volunteer cleanup events	29	30
I take hazardous waste (lamps, batteries, etc.) to special collection points	5	18
I save water, gas and electricity in my household	36	45
I buy energy-saving goods, equipment	29	41
I don't do any of the above	3	6
I do something else	1	2
Hesitate to respond	2	2
Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS.		

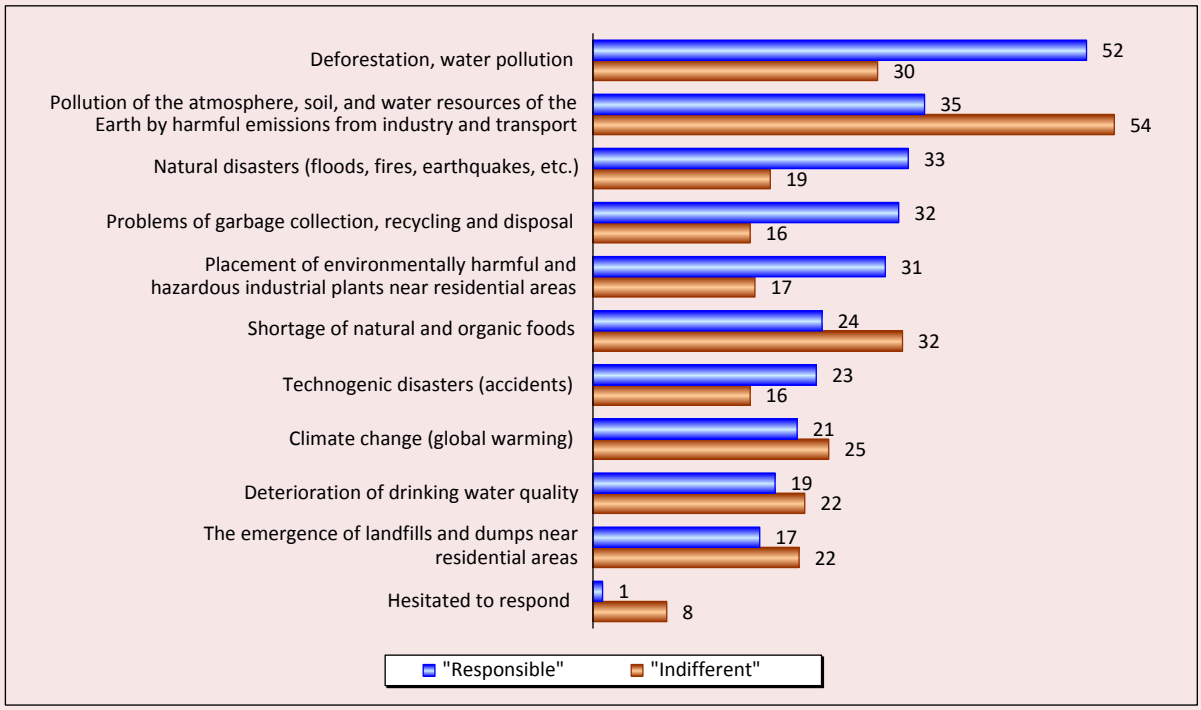
[22] Levashov V.K., Afanas'ev V.A., Novozhenina O.P., Shushpanova I.S. How do you live, Russia? XL stage of sociological monitoring, June, 2014: Express-information. Moscow: ISPR FCTAS RAS, 47 p.

Table 4. Distribution of responses to the question "Do you think that mankind's current needs for resources, minerals, and the environment are being met at the expense of future generations?", RF, % of respondents

Respond option	2014, V	2020, XII
Yes	43	51
No	24	20
Hesitate to respond	33	29

Source: data from the Center for Social and Socio-Political Research ISPR FCTAS RAS; Levashov V.K., Afanas'ev V.A., Novozhenina O.P., Shushpanova I.S. (2014). How do you live, Russia? The XL stage of sociological monitoring, June 2014: Express-information. Moscow: ISPR FCTAS RAS, 47 p. (Levashov, 2020).

Figure 6. Distribution of respondents' opinions on what is the most dangerous for the environment today, differentiated by the typological groups of "the responsible" and "the indifferent", RF, % of the number of respondents in the groups



Source: compiled according to the data from the Center for social and Socio-Political Research ISPR FCTAS RAS; Levashov V.K., Velikaya N.M., Shushpanova I.S. Where are you going, Russia? Express information. Moscow: FCTAS RAS, 2021. 47 p. Available at: http://испи.рф/wp-content/uploads/2021/02/куда-идешь-россия-экспресс.pdf. DOI: 10.19181/monogr.978-5-89697-344-7.2021

For the "indifferent" in first place is also the anthropogenic factor, but it has less concrete content and does not involve the definition of the subject of the problems. In second place in this group is the shortage of natural and organic food.

We consider the group "responsible" as carriers of a new type of environmental consciousness, the main factors in the formation of which are socio-demographic, political and socio-cultural. In particular, the group "responsible" is much younger: 39% of them are young people under 35 years old, the number of women (53.2%) is slightly higher than the number of men; the level of wealth is higher than that of "the indifferent": the proportion of "the well-off" and less than the proportion of

"the poor"[23]. Representatives of this group in the overwhelming majority (74.2%) believe that "people in power do not care about ordinary people" (the opposite opinion was expressed by 3.5%), which is associated with other claims to the state, for example in the social sphere. The "responsible" are less inclined to trust state institutions, public organizations, and especially the media (48.9% do not trust, 6.7% trust). In socio-political terms, they are rather optimistic: the majority (45.2%) feel confident about tomorrow, while 19.6% do not feel confident. Speaking about the future of Russia, the majority in the group (38.9%) believe that sooner or later the process of unification of peoples will begin around Russia.

As for the "indifferent" group, there are more men, fewer young people, and lower levels of wealth. Representatives of this group are more conformist: share of those who think that "the people in power do not care about common people" is 21 percentage points less (as compared to the "responsible"), they trust (30.3%) rather than do not trust (25.6%) public organizations; to a much greater extent than the "responsible" trust the mass media – 22.6%. 42.6% of the "indifferent" do not feel confident about the future.

It is obvious that the demand for a safe environment for the state on the part of society is growing. This actualizes the "green agenda", despite the problems of socio-environmental nature. According to the results of the 51st stage of the monitoring "How do you live, Russia?" (2021) almost half of the respondents (47%) believe that the state does not realize the right of citizens to a safe environment[24]. Consequently, the issue of environmental protection is likely to remain in the protest movement over the coming years.

Conclusion

Currently, despite the values of green economy and ecological modernization shared by the world community (Weale, 1992; Mol, Spaargaren, 1993), there is a high risk of new threats, including in the ecological sphere, needing to be identified and interpreted. At the same time, the interdependent processes of globalization – localization change the nature of risks and threats that confront individuals and society, and the ability of social actors to meet these threats.

Environmental and climate issues, albeit slowly, are gaining a political dimension in Russia as well, becoming an integral part of the political agenda, where ecological modernization plays an important role.

In recent years, the main actors involved in environmental issues have been the state and affiliated structures of civil society, while independent non-profit organizations have been pushed to the margins of public life. This can be seen in the reduction in the number of civic initiatives aimed at solving environmental problems. As a result, the main actors of environmental and conservation movements remain local and regional civic initiatives, which are limited to territorial problems related to everyday life and the possibility of environmental degradation depending on the actions of the authorities.

As evidenced by the results of research, the emerging environmental consciousness is gradually becoming an essential part of the public consciousness. Environmental problems of society begin to be

[23] According to the set of tools of the sociological monitoring "How do you live, Russia?", based on self-assessment of income levels, the following designations have been adopted: "the rich" – money is quite sufficient to afford oneself anything; "the well-off" – buying most durable goods (refrigerator, TV) is not difficult; "those with limited income" – money is enough to buy necessary food and clothing; "the poor" – money is only enough to buy food; "the have-nots" – money is not enough even to buy food.

[24] Levashov V.K., Velikaya N.M., Shushpanova I.S. "How do you live, Russia?" Express-information. 51st stage of sociological monitoring, June 2021: Bulletin; Moscow: ISPR FCTAS RAS, 2021. 42 p. Available at: https://www.fnisc.ru/publ.html?id=9956. DOI: 10.19181/monogr.978-5-89697-368-3.2021

perceived in a meaningful way by Russian citizens as a recognized threat to well-being, and there are prerequisites for the active participation of people in solving environmental problems of the present and future.

We can state that today the population of Russia does not have full access to objective, reliable and timely information about the state of the environment in places of their immediate residence, especially about the global environmental situation. The poor awareness of citizens about the implementation of the national project "Ecology" suggests that the relevant ministry pays insufficient attention to the organization of public relations and informing the public about the solution of environmental problems. Meanwhile, citizens' awareness of the importance of national projects and participation in their implementation is impossible without full and targeted information about the strategic goals and objectives of federal and regional programs in the environmental sphere.

Most Russian citizens have an idea of what a favorable environment is, what the environment is like where they live, and what the region's environmental problems are the most important. Individual social groups more concerned about environmental threats are emerging, leading to an ecologization of consciousness expressed in more responsible and consistent environmental behavior. The main carriers of the new ecological consciousness are young people living in large cities, with a relatively high level of income. They are characterized by features of social optimism – confidence in the future, faith in the future of Russia. At the same time, young people are rather disinclined to trust the actions of government agencies and public organizations in the field of ecology, strongly distrust the media, rely on their own strength, and show a higher level of civic maturity.

It is these groups that articulate a request to the state and believe that the most important measures to prevent man-made threats are enforcement of environmental legislation, stricter requirements for the disposal of chemical waste, treating the discharged gases and industrial products, introduction of environmental indicators and standards.

The results obtained will not only make it possible to update the tools of future waves of monitoring research, but can also be used to develop strategies to increase public involvement in solving environmental problems in the country and regions, primarily in the interaction between government, civil society and business.

References

Aksenova O.V. (2006). Social and environmental reflection in the West. *Istoriya i sovremennost'=History and Modernity,* 2, 162–187 (in Russian).

Ashkhamaf A.R. (2010). Ecological consciousness: To the problem of defining the concept. *Vestnik Adygeiskogo g os. un-ta. Seriya 1: Regionovedenie: filosofiya, istoriya, sotsiologiya, yurisprudentsiya, politologiya, kul'turologiya=Bulletin of Adyghe State University. Series 1: Regional studies: Philosophy, History, Sociology, Law, Political Science, Cultural Studies,* 3, 15–18 (in Russian).

Babkin V.O. (2014). Social ecology as a new emerging discipline and its relationship to human ecology. *Izvestiya Orenburgskogo gosudarstvennogo agrarnogo universiteta=Orenburg State Agrarian University,* 3, 183–186 (in Russian).

Beck U. (2010). *World at Risk*. Cambridge: Polity Press.

Beck U., Kropp K. (2007). Environmental risks and public perceptions. In: Pretty J., Ball A.S., Benton T. et al. (Eds.). *Sage Handbook on Environment and Society.* Sage. Available at: https://www.researchgate.net/publication/263656251_Environmental_Risks_and_Public_Perceptions

Berkut V.P. (2010). Ecophobic consciousness: History and modernity. *Voenno-istoricheskii zhurnal=Military Historical Journal,* 8. Available at: https://cyberleninka.ru/article/n/ekofobnoe-soznanie-istoriya-i-sovremennost (accessed: May 12, 2022; in Russian).

Bondarev V.P. (2010). The historical roots and theoretical basis of modern environmental sociology. *Vestnik Moskovskogo universiteta. Seriya 18. Sotsiologiya i politologiya=Moscow State University Bulletin. Series 18. Sociology and Political Science,* 2, 3–20 (in Russian).

Bookchin M. (1993). What is social ecology? In: Zimmerman M.E. et al. (Eds.). *Environmental Philosophy: From Animal Rights to Radical Ecology.* Englewood Cliffs (New Jersey): Prentice-Hall, Inc.

Bookchin M. (1996). *Rekonstruktsiya obshchestva. Na puti k zelenomu budushchemu* [Reconstructing Society. Toward a Green Future]. Nizhny Novgorod: Tretii put'.

Catton W.R., Dunlap R.E. (1978). Environmental sociology and new paradigms. *The American Sociologist*, 13, 41–49.

Deryabo S.D. (1999). *Ekologicheskaya psikhologiya: diagnostika ekologicheskogo soznaniya* [Environmental Psychology: Diagnosis of Environmental Consciousness]. Moscow: Mosk. psikh.-sots. institut.

Dunlap R.E., Catton W.R. (1994). Struggling with human exemptionalism: The rise, decline, and revitalization of environmental sociology. *The American Sociologist*, 25(1), 25–30.

Efremenko D.V. (2006). *Ekologo-politicheskie diskursy: Vozniknovenie i evolyutsiya* [Environmental-Political Discourses: Emergence and Evolution]. Moscow: INION

Gladun E.F. et al. (2021). Green governance: The concept of environment-oriented regional development. *Voprosy gosudarstvennogo i munitsipal'nogo upravleniya=Public Administration Issues,* 3, 31–52 (in Russian).

Gordin I.V., Ryumina E.V. (2021). Regional and environmental factors in the mental component of human potential. *Regionologiya=Russian Journal of Regional Studies,* 29, 1(114), 151–171. DOI: 10.15507/2413-1407.114.029.202101.151-171 (in Russian).

Kefner N.V., Morgun A.V. (2020). Environmental non-profit organizations in the Russian Federation under conditions of adoption of the law "on foreign agents": Consequences and methods of adaptation. In: Kefner N.V., Popova Yu.V. et al. (Eds.). *Razvitie politicheskikh institutov i protsessov: zarubezhnyi i otechestvennyi opyt: sb. nauchn. statei XI Vseross. Konf. s mezhdunar. uchastiem* [Development of Political Institutions and Processes: Foreign and Domestic Experience: Coll. of Scientific Papers of the 11th All-Russian Conference with International Participation] (in Russian).

Kozlovskii V.V., Nedoseka E.V., Tishkov S.V. (2022). Environmental practices of waste management in the small towns of the European part in the Arctic zone of the Russian Federation. *Regionologiya=Russian Journal of Regional Studies,* 30, 1(118), 129–154. DOI: 10.15507/2413-1407.118.030.202201.129-154 (in Russian).

Kulyasov I.P. (2005). Environmental modernization: Theoretical aspects. *Zhurnal sotsiologii i sotsial'noi antropologii=The Journal of Sociology and Social Anthropology,* 8(3), 100–113 (in Russian).

Levashov V.K. (2020). *Politicheskaya kul'tura rossiiskogo obshchestva (Opyt sotsiologicheskogo issledovaniya): monografiya* [Political Culture of Russian Society (Experience of Sociological Research): Monograph]. Moscow: FNISTs RAN. DOI: 10.19181/monogr.978-5-89697-347-8.2021 (in Russian).

Levashov V.K., Velikaya N.M., Shushpanova I.S. et al. (2021). *Sotsial'noe gosudarstvo i grazhdanskoe obshchestvo v usloviyakh realizatsii natsional'nykh proektov: monografiya* [Social state and civil society in the context of implementation of nation projects: Monograph]. Moscow: FNISTs RAN. Available at: https://www.fnisc.ru/index.php?page_id=1198&id=9514 (in Russian).

Losev A.V., Provadkin G.G. (1998). *Sotsial'naya ekologiya* [Social Ecology]. Moscow: Gumanitarnyi izd. tsentr "Vlados".

Maslova E.A. (2022). The global "green imperative": Russia's place in the international climate regime. *Polis. Politicheskie issledovaniya=Polis. Political Studies,* 1, 19–30. DOI: 10.17976/jpps/2022.01.03 (in Russian).

Meadows D., Randers J., Meadows D. (1991). *Predely rosta* [Limits to Growth]. Translated by Sarkisov A. Moscow: Izdatel'stvo MGU.

Mol A.P.J. (1995). *The Refinement of Production. Ecological Modernization Theory and the Chemical Industry.* Utrecht: Van Arkel.

Mol A.P.J., Spaargaren G. (1993). Environment, modernity and the risk-society. The apocalyptic horizon of environmental reforms. *International Sociology*, 4, 431–459.

Oreshkina T.A. (2014). Environmental consciousness of the population in the activities of local government (on the example of old industrial cities of the Ural). *Istoriya i sovremennost'=History and Modernity,* 2(20), 112–126 (in Russian).

Oreshkina T.A., Konyashkin V.A. (2018). Ecological consciousness and ecological discourses of civilization. *Oikumena. Regionovedcheskie issledovaniya=Ojkumena. Regional Researches,* 4, 133–144 (in Russian).

Panov V.I. (2004). *Ekologicheskaya psikhologiya: Opyt postroeniya metodologii* [Environmental Psychology: Experiences in Methodology]. Moscow: Nauka.

Rastorguev S.V. (2022). Environmental issues in the election programs of the parliamentary parties of Russia in 2021. *Vlast'*, 2, 59–65 (in Russian).

Shumeiko A.A. (2003). Developing the environmental mentality as a social need. *Vestnik KRAUNTs. Gumanitarnye nauki=Bulletin of Kamchatka Regional Association. Humanities,* 1, 46–54 (in Russian).

Shushkova E.V., Elbakidze M., Biryukova M.V. (2017). Rationale for the elements of green infrastructure at the regional level. *Pskovskii regionologicheskii zhurnal=Pskov Journal of Regional Studies,* 2(30), 96–107 (in Russian).

Tsepilova O.D. (2019). Political and socio-economic development of modern Russia: Environmental constraints and risks. *Teleskop: Zhurnal sotsiologicheskikh i marketingovykh issledovanii=Telescope: Journal of Sociological and Marketing Research,* 2, 20–27 (in Russian).

Velikaya N.M. (2019). Sociocultural threats and opportunities for sustainable development. In: Osipov G.V., Ryazantsev S.V., Levashov V.K., Rostovskaya T.K. (Eds.) *Strategiya proryva i tsifrovaya real'nost' Rossii. Sotsial'no-politicheskoe polozhenie i demograficheskaya situatsiya v 2019 godu: koll. Monografiya* [Breakthrough Strategy and Russia's Digital Reality. Socio-Political Situation and Demographic Situation in 2019: Coll. Monograph]. Moscow: Perspektiva (in Russian).

Voronov B.A., Narbut N.A. (2013). Ecological framework of the territory and its system properties. *Geografiya i prirodnye resursy=Geography and Natural Resources,* 3, 171–177 (in Russian).

Vorontsov S.A., Ponedelkov A.V., Nuvakhov T.A. (2017). Ecological safety as an integral part of the national security of Russia: Problems and directions of their solution. *Nauka i obrazovanie: khozyaistvo i ekonomika; predprinimatel'stvo; pravo i upravlenie=Science and Education: Economy and Economics; Entrepreneurship; Law and Management,* 3(82), 134–137 (in Russian).

Weale A. (1992). *The New Politics of Pollution*. Manchester – New York: Manchester University Press.

Wolf E. (1972). Ownership and political ecology. *Anthropological Quarterly,* 45(3), 201–205.

Yanitskii O.N. (2014). The concept of ecosocial knowledge. *Sotsiologicheskie issledovaniya=Sociological Studies,* 4, 3–13.

Information about the Authors

Nataliya M. Velikaya – Doctor of Sciences (Political Science), Professor, deputy director for science, Institute of Socio-Political Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences Moscow, Russian Federation (6, Fotieva Street, Moscow, 119333, Russian Federation; e-mail: natalivelikaya@gmail.com)

Ol'ga P. Novozhenina – Senior Researcher, Institute of Socio-Political Research – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences Moscow, Russian Federation (6, Fotieva Street, Moscow, 119333, Russian Federation; e-mail: olganov@mail.ru)

Received May 20, 2022.

DOI: 10.15838/esc.2022.4.82.14
UDC 338.001.36:004, LBC 65.5

The Age Factor in the Digital Divide: The Edges of Inequality

Mariya A.
GRUZDEVA
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: mariya_antonovarsa@mail.ru
ORCID: 0000-0001-8759-4953; ResearcherID: H-4981-2017

Abstract. At the end of the 1990s – beginning of the 2000s, due to the spread of the Internet at an increasing rate in certain countries, while others were lagging behind, it became necessary to study the digital gap issues. At the present stage, when the existence of the digital divide in the world and individual states is obvious and proven, researchers have focused on studying its factors. The article aims to assess the influence of the age factor on the scale and prevalence of the digital divide within a three-level model. To do this, we consider theoretical and methodological approaches to studying the age factor of the digital divide; we analyze trends in the use of information and communication technologies by representatives of various age groups, and the inclusion of children, adolescents and the elderly in the digital environment. The model of three levels of the digital divide developed by modern scientists is used as a theoretical basis. According to the model, inequality manifests itself in access to technical means, differences in the digital literacy, and the benefits derived from digitalization. In the course of the work, we use a set of general scientific methods. We reveal significant differences in the practices of using personal computers and the Internet among representatives of different age groups and calculate the time periods necessary to reduce intergenerational gaps in Russia and the Vologda Oblast. We assess the impact of online habits on a person's life, the purposes of using the Internet and the possibility of receiving bonuses from it, the availability of digital skills for various age groups of Vologda Oblast population. The scientific novelty of the study consists in assessing the influence of the age factor on the prevalence of digital gap parameters at the regional level. The results can be used for identifying the groups that are at risk of being excluded from the processes of digital development. The findings will be also useful in formulating the relevance

For citation: Gruzdeva M.A. (2022). The age factor in the digital divide: The edges of inequality. *Economic and Social Changes: Facts, Trends, Forecast,* 15(4), 228–241. DOI: 10.15838/esc.2022.4.82.14

of social retraining programs for the able-bodied population in accordance with the requirements of new jobs, in teaching older people digital skills, and in making managerial decisions for successful digital development.

Key words: information and communication technologies, digital divide, age factor, youth, elderly people, older people, middle-aged people, digital skills, Internet.

Acknowledgment

The reported study was funded by the Russian Foundation for Basic Research and the Expert Institute for Social Research in the framework of scientific project 21-011-31702 "Digitalization of civic participation: Progress in achieving social effects vs imitation of a socially useful activity".

Introduction

Studying the digital divide has become a topic issue of research in the context of large-scale digitalization of the economy and everyday practices of the population. And if in the initial period of modern information technologies development studies were interested in the access to the information and communication technologies (technical, physical, and the need for them in the value and cultural framework and reference points of modernization development), then now, when every second person on the Earth uses the Internet (or 53.6 people out of 100 in 2019[1]), it is most relevant to study the technology itself, their goals and factors contributing to unequal access to them.

Digital technologies are produced and used unevenly, there are differences both between and within countries. This has become the subject of numerous foreign and Russian researches (Nieminen, 2016; Ragnedda, Kreitem, 2018; Ragnedda, 2018; Gruzdeva, 2020; Shinyaeva et al., 2019; Gladkova et al., 2019). Along with this, issues related to the drivers of the digital divide especially at the local level (in the case of Russia – between and within regions and municipalities), remain insufficiently studied. Besides, one of the current issues related to the digitalization of society is to understand the mechanisms that will change established, institutionalized forms of interaction in society, social perceptions, values and orientations in a new social context (Zarubina, Vlasova, 2018). Thus, at the modern stage of the digital development trends appear in one way or another related to people of different age groups and generations earlier digital inclusion of children (Shabunova, Korolenko, 2019), digitalization of jobs, which is relevant for people of working age, population aging and the resulting barriers to digital participation on par with its increasing importance for older people (Senokosova, 2018; Smirnykh, 2020). This predetermines the relevance of research in this direction.

The purpose of our study is to assess the influence of the age factor on the parameters of the digital divide in a three-level model. To achieve this goal, we have set and implemented the following tasks: considered the theoretical and methodological approaches to the study of the age factor influence on the digital inequality; analyzed trends in the use of ICTs by people of different ages, the features of digital inclusion of children and adolescents, representatives of the third age.

The scientific novelty of the study is to assess the impact of the age factor on the prevalence of parameters of the digital divide at the regional level.

[1] Source: ITU World Telecommunication Indicators Database. Available at: https://www.itu.int/en/ITU-D/Statistics/Pages/default.aspx

Materials and methods

The research is based on the three-level model of digital inequality, which is widely spread abroad (one of the prominent representatives of this direction is Massimo Ragnedda) and is being developed in Russia (research school of the HSE University – M.Yu. Arkhipova, V.P. Sirotin; Lomonosov Moscow State University – A.A. Gladkova; Kazan Federal University – V.Z. Garifullin; Ulyanovsk State University – A.R. Safiullin, O.A. Moiseeva et al.) (Arkhipova et al., 2018; Gladkova et al., 2019; Safiullin, Moiseeva, 2019). According to the model, the digital divide can manifest itself at three main levels: 1) the level of public access to the Internet and other ICTs; 2) the level of digital competence of users and digital literacy; 3) the level of social benefits that users receive with the competent and full application of digital technologies in professional and private life. In the joint work of one of the founders of the model M. Ragnedda (UK) and scientists from Russia – A.A. Gladkova (Lomonosov Moscow State University) and V.Z. Garifullin (Kazan (Volga region) Federal University) outlined the range of possible indicators to assess each level of inequality (Gladkova et al., 2019), which formed the basis of our study.

To implement the goals and objectives, we used a set of scientific methods, in particular, comparative analysis, statistical analysis, sociological methods. To analyze the results, we applied methods of system-structural and cross-tabulation analysis, to assess the dynamics of gaps – the method of "distance in time", there is a comparison of all-Russian data with regional data. Theoretical base consists of the scientific works on digital divide issues, its prevalence, assessments methods, determinants.

The object of the study is the Vologda Oblast. The research period in each case is limited by the availability of statistical data.

The information base for the work was the official data of the International Telecommunication Union, collections of statistics published jointly by Rosstat and the Higher School of Economics: *Digital Economy Indicators*, *Information Society in the Russian Federation*, and *Information Society: Main Characteristics of the Constituent Entities of the Russian Federation*. We also took into account the data of several regional surveys of the population, conducted by Vologda Research Center of the Russian Academy of Sciences:

1. Survey of the Vologda Oblast population in August 2020 (sample size – 1,500 people, the sample is representative, the error does not exceed 5%, the method of conducting – survey at the respondent's home).
2. Survey of families with children aged 3 to 17 years in the Vologda Oblast in 2018 (sample size – 1,500 people, the sample is representative, the error does not exceed 5%, the method of conducting – survey at the respondent's home).
3. Survey of the elderly "Quality of life of the elderly" in the Vologda Oblast in 2015, 2018 (sample size – 1,500 people aged 50 years and older, the sample is representative, the error does not exceed 5%, the method of conducting – survey at the respondent's home).
4. Survey of the Vologda Oblast population "Active ageing and its factors" in 2021 (sample size – 1,500 people aged over 18, the sample is representative, the error does not exceed 5%, the method of conducting – survey at the respondent's home).

Findings

The analysis of sources on the digital divide revealed that the authors often consider income level, education level, age, gender, territory of residence, and technical capabilities among its factors. No doubt, these parameters can determine the digital divide in a complex, as they themselves have points of contact with each other. At the same time, they can be considered separately, if during the analysis we take as a hypothesis that the parameter is dominant, which was done in this case.

Modern researchers, when studying digital divides or barriers, in one way or another address the relationship between the age of personal computer and Internet users and the formation and extent of the digital inequality[2] (Volchenko, 2016; Shinyaeva, Slepova, 2019; Robinson et al., 2015; Yates et al., 2015). It has been proven that age affects the use of digital services, particularly financial services (Kuchmaeva, Arkhipova, 2017), consumer behavior online (Gorelova, Serebrovskaya, 2021). The paper (Varlamova, 2022) shows that the dynamics of the intergenerational gap in access to the Internet are quite stable and, in the absence of external shocks, will remain within the existing boundaries in the short term.

Most often, groups of the population fall under the study, taking into account certain socio-demographic characteristics, with age being a fundamental factor: children, young people and the elderly (more often pre- and retirement age, the third – 60 and older, and the fourth – 75 and older age groups). For each group, digital literacy is measured[3] (Smirnykh, 2020; Solomatina, 2020). Sociology, psychology, pedagogy, and demography have studied the impact of early digitalization on health, academic achievement, and addictions (Chassiakos et al., 2016; Donelle et al., 2021; Shakirova, 2017; Shakirova, 2020). A large part of the research field on this issue is occupied by various aspects of the elderly's position in the context of digitalization. The benefits of increasing the inclusion of this age group in the use of digital benefits are considered, in particular concerning quality of life (through active involvement in modern changing social life, enhanced communication opportunities, including maintaining intergenerational connections) and possible prospects for employment and extension of employment, retraining in older age (Bikkulov, Sergeeva, 2016; Darinskaya, Moskvicheva, 2017; Dmitrieva, 2018; Lelkes, 2013; Anderson, Perrin, 2017; Mitzner et al., 2019).

A number of authors consider computer and Internet use to be an important tool for preserving sustained cognitive function and extending longevity among older people (Charness, Boot, 2009; Berner et al., 2012).

Thus, a review of the literature shows a clear interest in the issue of age in the study of different aspects of digitalization. There is a lot of experience in the study of particular groups of users. However, a general picture of the differences in access to ICT, digital skills, privileges in the use of the Internet by age groups, in particular at the regional level, is not formed, which confirms the relevance of research in this direction.

Turning to the direct influence of the age factor on the prevalence of the digital inequality, we will analyze its characteristics according to a three-level model.

The first level of inequality. As a result of analysing the data of Russian sociological observations regarding the practice of using personal computer (PCs) and the Internet, we have revealed a significant age heterogeneity. The World Wide Web is used by almost all teenagers, young people and people of active working age (ranging from 93% to 99% in 2019; *Tab. 1*), and only a small part of older people aged 55 to 74 years. In addition, an important trend worth noting is the significant growth rate of Web usage in older age groups, with an average annual growth rate ranging from 3.7 p.p. for the 45–54 age group to 5.8 p.p. for the 65–74 age group.

[2] The digital divide: What threat does it pose to Russia and what is its scale? Available at: https://iq.hse.ru/news/465308186.html

[3] Zhulin A.B., Artamonov R.E., Titov E.A. (2021). Estimation of digital readiness of Russia's population: Report to the 22nd April International Scientific Conference on Problems of Economic and Social Development, Moscow, April 13–30, 2021. Moscow: The Higher School of Economics Publishing House.

Table 1. Practices of using personal computers and the Internet in different age groups (Russia), % of respondents

Age	2016	2017	2018	2019	Changes, 2019 to 2016, p. p.
15–24	98.1	98.2	98.7	99.0	0.9
25–34	96.1	97.2	98.2	98.2	2.1
35–44	91.8	93.9	96.4	96.8	5.0
45–54	79.0	85.7	90.4	92.5	13.5
55–64	57.9	66.8	75.4	78.1	20.2
65–74	32.9	41.7	50.7	56.1	23.2

Applying the "distance in time" method, we can calculate the distance that the generation of current retirees (55–64 and 65–74 years old) must travel to reach the level of digitalization of today's young people. The maximum value of access to the Internet was recorded in the youngest of the groups surveyed (young people aged 15–24), so it was chosen as the base. We found that at the current rate of growth of Internet access and the absence of external shocks, representatives of the 55–64 age group need 4.2 years to reach the level of digitalization, comparable with the youth cohort; for representatives of 65–74 age group this path will be 7.4 years.

Regional data repeat the national trend, 98% of young people aged 18–30 use the Internet. The least included in various aspects of digital activity are older people. However, the situation is changing. Regular study of lifestyles of the elderly in the Vologda Oblast, due to the particular relevance of this issue, suggests that digital technology is increasingly entering the familiar way of life of this category of the population. We revealed that in the period from 2015 to 2021 the proportion of the elderly who use the Internet has increased in the region from 36 to 59% (the average annual growth rate is less significant than the Russian average and is 3.3 p.p.; *Tab. 2*). The frequency of use is also increasing, now 20% already get on the net daily, another 25% – several times a week (this is 12 and 11 p.p. more than 6 years ago).

For example, in the Vologda Oblast, it takes 11.7 years for older people over 50 years to reach the same level of Internet accessibility as for young people, if the trends of involvement in the digital space continue.

Despite the different rates of growth in the involvement of the elderly in the average Russian regions and in the Vologda Oblast, there is a trend toward the convergence of generations in the use of digital benefits, which is confirmed in the Russian research. So in the work (Bikkulov, Sergeeva, 2016) on the basis of sociological data obtained in 2015 in Saint Petersburg and two district centers (Gatchina, Chudovo), it is concluded that older people are narrowing the gap with other age groups in the use of the Internet, they actively use it as a source of information and a tool for communication, spend

Table 2. Internet use among the elderly in the Vologda Oblast

	2015	2018	2021	Changes, 2021 to 2015, p. p.
Internet use	36.0	42.2	59.2	+23.2
Frequency of use				
Everyday	8.5	13.4	20.5	+12.0
Several times a week	13.3	15.1	24.1	+10.8
Several times a month or less	9.8	11.1	11.5	+1.7
Source: data from the population survey "Quality of life of the elderly population", 2015, 2018, "Active aging and its factors", 2021, VoIRC RAS.				

much time at the monitor. "Non-user" worlds are shrinking. Also, the active push of e-commerce development received during the pandemic led to the conclusion of a change in the consumer behavior of the older population. Researchers (Gorelova, Serebrovskaya, 2021) found that the share of online shoppers over the age of 55 increased from 24% in 2019 to 53% in 2020.

Undoubtedly, the reasons for less Internet activity of the older generation are related to several aspects, which are discussed in the article. One of them is the general trust in information technology and assessment of its impact on life. The most engaged groups of the population evaluate them more positively, while negative and ambiguous assessments prevail among older people. However, during the available 5 years of observation the situation is significantly changing among the elderly: the confidence in the Internet is increasing (thus, among the people aged 55 to 64 the proportion of positive assessments increased by 23 p.p., among the people aged 65 to 74– by 24 p.p.; *Tab. 3*). For younger representatives, the changes are not so significant; they are initially characterized by predominantly positive assessments.

The second level of inequality. Let us turn to more narrow characteristics, namely the manifestation of Internet activity. The results of sociological research show a significant difference in the purpose of using the Internet in terms of age groups – all of the options under consideration are significantly more common among young people under 30. The older a person is, the lower is the representation of different types of their activities in the network (*Tab. 4*). People aged over 55 years are 11 times less likely than young people under 30 to download software, use distance learning services, 8 times less likely to play games, 6 times – search for jobs and information of interest, post their opinions on social and political events, 5 times – upload personal information for public access and download something interesting, 4 times – make online purchases, use messengers and seek information for their cultural development and broadening their horizons, etc. Even with regard to the much-popular participation in social media, which is declared to be an effective tool for intergenerational communication and reduction of isolation and loneliness of the elderly, you can see a threefold difference. When comparing young people to middle-aged people, differences are not significant for such purposes of Internet use as participation in social networks (87 and 71%, respectively), conducting financial transactions (44 and 42%), using e-mail (41 and 37%), and buying and selling goods (32 and 29%). Vologda residents aged 30–55 are noticeably less frequently than young people to use the Internet to download software, movies, music, video or computer games, and distance education.

Table 3. Assessment of the impact of information technology and information and communication networks on the lives of people in different age groups (Russia), % of the total population of the relevant age groups

Age	Positively			Ambiguously			Negatively			Nothing has changes		
	2015	2018	2019	2015	2018	2019	2015	2018	2019	2015	2018	2019
15–24	90.6	95.9	94.9	3.6	2.3	2.2	0.3	0.1	0.2	2.3	0.9	1.0
25–34	85.5	92.8	92.1	6.2	4.2	4.6	0.6	0.2	0.3	3.8	1.7	1.5
35–44	76.5	88.7	88.2	10.4	6.6	7.0	1.3	0.5	0.5	5.3	2.5	2.1
45–54	64.1	81.2	82.0	13.3	9.8	9.9	2.5	1.1	1.1	10.0	4.5	3.4
55–64	46.4	67.3	69.4	16.0	14.5	14.4	4.7	2.3	2.2	15.7	9.4	7.2
65–74	29.0	48.9	52.9	16.3	19.0	18.1	8.2	4.8	4.3	21.0	15.0	12.5

The sum of the answers is less than 100%, as there was an option "Hesitate to respond".
Source: Information Society in the Russian Federation. 2020: Stat. collection.

Table 4. Purposes for using the Internet (Vologda Oblast), % of respondents

Respond option	Under the age of 30	Aged 30–55 years	Over the age of 55
Social networks	87.1	71.3	31.9
Search for information about products and services	56.9	48.4	17.1
Phone or video calls (e.g. via Skype)	66.4	48.6	25.2
Downloading movies, pictures, music; watching videos; listening to music or the radio	66.8	38.8	14.5
Sending or receiving e-mails	41.4	37.4	11.1
Obtaining knowledge and references on any topic using Wikipedia, online encyclopedias, etc.	32.3	24.4	10.1
Making financial transactions	44.0	41.5	18.9
Search for information related to health or health care services	23.7	21.5	12.3
Upload personal files (books/articles/magazines, photos, music, videos, programs and other content) to websites, social networks, cloud storage for public access	31.9	22.8	6.3
Video or computer games / mobile games or downloading them	37.9	24.0	4.6
Sale/purchase of goods and services (including through auction sites)	31.5	27.8	7.2
Reading online or downloading newspapers or magazines, e-books	22.4	15.8	7.2
Communication via instant messaging systems (chats, ICQ, QIP, etc.)	23.7	14.6	6.2
Search for information about cultural heritage objects and cultural events, take virtual tours of museums and galleries, etc.	12.9	11.6	3.0
Search for information about education, courses, trainings, etc.	22.4	15.4	3.7
Search for jobs	25.0	14.3	4.1
Downloading software (except computer games)	15.1	7.7	1.2
Participating in online voting or consultations on social and political issues	8.2	5.6	2.5
Distance learning	24.6	11.8	2.1
Participation in professional networks (e.g. Linkedin, Xing, E-xecutive.ru, etc.)	3.4	2.3	1.1
Publication of opinions on social and political issues through websites, participation in forums	3.0	2.6	0.5
Other	0.4	1.1	1.6
Source: data of a population survey conducted in August 2020, VoIRC RAS.			

Next, we turn to the analysis of digital skills. It is logical to assume that they will be determined by the respondents' education and the time when it was acquired. Conventionally, if the representatives of today's older people received their education at a time when there were no computers, telephones, and modern means of communication, then the representatives of the middle age were more immersed in this environment, not to mention young people. But it is worth clarifying that we are mainly talking about skills formed at the household level (the use of ICT for personal purposes) and often used by service sector employees, public sector workers and other professionals who spend their working time at a computer, applying certain skills on a daily basis. In this case, the trend described above repeats itself: young people have more developed digital skills than older people. It is worth clarifying that we are not talking about the sufficiency of skills for certain purposes, as this requires additional study and theoretical and methodological elaboration. The goal is only to determine the scale of the differences. Thus, most significantly older people lag behind young people in special narrowly focused skills, which is due as well to the difference in education. However, they are much less likely to have skills that are common to most of the population: working with spreadsheets, connecting new devices (4 times; *Tab. 5*), transferring files from external devices to the computer, copying information inside files

Table 5. Digital skills among the Vologda Oblast population, %

Skill	Under the age of 30	Aged 30–55	Over the age of 55
Using a text editor	83.2	72.5	37.0
Sending an -email with attached file(s)	84.1	71.3	33.9
Copying or moving a file or folder	81.0	69.3	33.2
File transfer between a computer and peripheral devices (digital camera, player, cell phone)	80.6	68.2	30.0
Using the copy and paste tool to duplicate or move information in a document	77.6	60.8	25.4
Using photo, video, and audio editing software	70.7	58.3	20.8
Working with spreadsheets	69.4	52.8	17.1
Connecting and installing new devices	64.7	50.8	16.2
Creation of electronic presentations using special programs	57.8	44.4	11.8
Changing the parameters or configuration settings of the software	49.1	33.8	9.7
Installing a new or reinstalling the operating system	42.2	30.5	8.8
Writing software using programming languages	36.6	24.4	7.2
Source: data of a population survey conducted in August 2020, VoIRC RAS.			

and editing photo, video and audio files (3 times), working with a text editor, copying files and folders, sending e-mail with an attached file (2 times). As found earlier, when comparing goals for Internet use, the differences between seniors and middle-aged people are mostly erased by specialized skills, in other cases the gap is closer to the differences with young people.

The revealed age differences in using the Internet and having the skills are also confirmed by the reasons for not using the Internet. For young people, all of the suggested reasons were not as pronounced as for older people. Almost 42% of people aged over 55 have no need to use the Internet, another 27% refuse due to lack of skills, 5% are concerned about security and privacy issues on the Internet, while young people are almost not concerned about this topic.

The third level of inequality. Speaking about the level of social benefits that users receive with the competent and full application of digital technology in professional and private life, most researchers refer to the most popular topic in everyday life – receiving state and municipal services online (Khvatov, Vatoropin, 2017; Ershova, 2018; Dobrinskaya, Martynenko, 2019).

The authorities are also interested in studying the demand for digitalization of this interaction area between society and the state. For example, the federal project "Digital public administration" of the national program "Digital Economy of the Russian Federation" [4] involves comprehensive digitalization and using the Internet to solve most of the life situations of Russians. This, in turn, implies a certain willingness and ability of the population to be involved in these processes. Age profile of ways to receive various services revealed the following picture: young people under 30 prefer to receive almost all services through the Internet (for the most part using the "Gosuslugi" portal), the only difference lies in respect of social services related to pensions, benefits, allowances, which is rather due to their low accessibility for this age group (*Tab. 6*). Speaking about other surveyed population groups by age (30 years and older), it is worth noting that they are more used to receiving services directly by visiting the office. If for people aged 30–55 for a number of popular services (such as health services, addressing issues related to housing, utilities,

[4] Official website of the Ministry of Digital Development, Communications and Mass Media of the Russian Federation. Available at: https://digital.gov.ru/ru/activity/directions/858/

transportation, driving, receiving benefits) are in equal demand both online and offline forms, for the population of preretirement and retirement age for all categories of services used prevails personal application for a service without the use of the Internet, state and municipal portals.

The next important question in the study of Internet activity is what bonuses and privileges are received by users of digital services. We have analyzed what benefits people of different ages see when using the Internet for themselves and their relatives/friends. As before, the differences were significant: while 59% of young people and 47% of middle-aged people note the benefits of the Internet, for older people it is not so obvious (the proportion of responses is only 24%). There were also twice as many among the elderly who answered that there were generally no positive effects compared to the young (14% vs. 7%). Of course, about a quarter of all age groups surveyed were pragmatic and said they were receiving some harm in addition to the benefits. Speaking of specific and measurable benefits from using the World Wide Web, it is worth noting that about half of those surveyed of all ages have not yet managed to earn or save money/time while using the Internet. However, among young and middle-aged people approximately equally common are practices using the Internet, including remote employment (21% each), examples of selling or exchanging things on Internet resources (16% each), making profitable purchases (33% for young and 24% for middle-aged people), saving time by using online services, deliveries, and so on (21 and 23%, respectively; *Tab. 7*).

Table 6. Distribution of responses to the question "Have you applied for the following categories of services in the last 12 months, and in what form?" (Vologda Oblast, ranked by the share of online applications), % of respondents

Service category	Under the age of 30		Aged 30–55		Over the age of 55	
	Applied online	Applied in person	Applied online	Applied in person	Applied online	Applied in person
Health services (medical appointments, disability confirmation)	22.8	18.5	22.1	22.0	9.5	28.9
Apartment, construction and land (payment of utilities, building permits, redevelopment, property registration, etc.)	20.3	10.3	20.0	17.3	8.1	20.3
Transportation and driving (car registration, driver's license, fines, etc.)	18.1	7.3	13.6	12.6	2.5	7.4
Pensions, benefits and allowances	9.1	11.6	13.7	13.3	4.8	25.2
Taxes and finances (debts, declarations, etc.)	9.9	6.5	12.6	16.1	4.8	10.4
Family and children (civil registration, maternity capital)	10.8	6.5	11.1	10.1	0.5	1.8
Passports, registrations, visas	13.8	11.6	8.7	8	0.9	3.5
Education (application for an educational organization, kindergarten queue)	11.6	5.2	7.7	7.0	0.5	2.1
Work and employment (unemployment registration, unemployment benefits)	4.7	4.3	4.4	4.4	1.2	1.2
Licenses, certificates, accreditations (for weapons, hunting, certificates of the Ministry of Internal Affairs, etc.)	7.3	3.4	2.6	5.4	0.9	2.6
Business, entrepreneurship, non-profit organizations (registration of legal entities)	3.0	0.9	3.6	2.7	0.5	1.1
Source: data from a population survey conducted in August 2020, VoIRC RAS.						

Table 7. Distribution of responses to the question "Have you ever managed to earn or save money and time with the help of the Internet?" (Vologda Oblast), % of the number of respondents

Respond options	Under the age of 30	Aged 30–55 years	Over the age of 55
No, I have not managed to earn and/or save money and time while using the Internet	45.3	46.6	56.1
Yes, I work(ed) using the Internet	21.6	21.1	5.3
Yes, I have successfully sold/exchanged my stuff using online resources	16.4	16.7	3.9
Yes, I have made profitable purchases on the Internet	33.2	23.7	6.3
Yes, with the help of the Internet I saved my time (received state and municipal services online, ordered home delivery, etc.)	21.1	23.4	7.2
Other	0.9	0.6	0.7
Source: data from a population survey conducted in August 2020, VoIRC RAS.			

For people of retirement and pre-retirement age, all of the above practices are not popular and account for less than 10% of responses each.

As part of the study of the age factor contributing to the digital divide, the younger and older age groups are of research interest. The former are viewed from the perspective of early initiation into gadgets and the Internet, threats to health, barriers and drivers of learning and educational achievement, the latter from the perspective of greater exclusion from digitalization processes, less competitive advantage to occupy new digital jobs, and new perspectives on intergenerational communication using new technologies.

This issue was also studied at the regional level. Thus, within the framework of the research project on the formation of human potential of children, it was found that modern children join the use of gadgets and the Internet much earlier (in 2018 among preschoolers the average age of beginning to use 3.6 years; younger students – 6 years; teenagers 11–14 years – 7.6 years; high school students – 9.2 years). For high school students, digital skills for the most part have a positive impact on school performance (modern requirements for the school curriculum involve active use of ICT), while for representatives of the junior school the opposite is true (Shabunova, Korolenko, 2019). In our opinion, this is determined by two main factors: the age of initiation and organization of the child's use of the World Wide Web on their own (self-discipline) and parental control (direct and through the implementation of alternative types of joint activities/leisure time). The results of Russian surveys also show that the main purposes for children[5] to use the Internet are equally entertainment (79%) and preparation for lessons, school projects (79%), 54% is communication in social networks, a little less than 4% is distance education. The phenomenon of people born after the digital revolution and got used to receive information through digital channels is also of research interest in contemporary scientific discourse. So-called "digital natives" are endowed with attributes of high technological giftedness, orientation to multitasking, fast information processing, preference for hypertexts, greater efficiency when working online than offline, calling for large-scale institutional restructuring (for the most part the education system) (Ershova, 2019). However, the results of research show the overestimation of the named characteristics of the new generation, many negative consequences of greater inclusion of children in the digital environment and call for careful (and not radical) changes in the social structure.

[5] Information Society in the Russian Federation. 2018, 2019: Stat. collection. The data for 2018 are used.

Discussion

The study made it possible to draw a number of conclusions consonant with the previously obtained results of Russian and foreign studies. In turn, the work contributes to the understanding of the regional picture of digital gaps associated with age.

So, at the present stage, the age factor influences the spread of digital inequality, this trend exists both within the country and within the region. Digital divide manifests itself depending on age at all levels according to a three-level model developed in modern studies: the practices of PC and Internet use, assessment of their impact on human life, the purpose of using the Internet, the availability of digital skills and the use of public and municipal services online.

The digital activity of the elderly differs in comparison with both the youngest of the surveyed groups (18–30 years old) and the middle-aged people, especially on the parameters that require special knowledge and effort to learn and master in practice. Using the "distance in time" method, we revealed how long it will take older people to reach the same level of Internet use as young people. On average in Russia, these figures are 4.2 years for young retirees aged 55–64, and 7.4 years for people aged 65–74. In the Vologda Oblast the intergenerational gap is more pronounced; it will take an average of 11.7 years to eliminate it. This scenario is possible in the absence of external shocks and preservation of the existing growth rates.

Obviously, the age differentiation of digital gaps is determined by the age of exposure to ICTs, the need to use digital skills in the workplace, personal motivation, and trust in technology. In the near future, gaps in access to the Internet will persist.

The conclusions are largely congruent with the results of the studies analyzed as part of the literature review. The main link is the evidence of greater involvement of young people and people of working age in the use of ICTs, the successful practices of benefiting from this, which is dictated by global trends in the digitalization of the economy and social sphere, the current socio-economic situation in the world and the country, the requirements of new jobs and fundamentally new formats of employment. The other side is the greater exclusion from digitalization and the vulnerable position of the elderly, which is also due to a number of objective reasons (later inclusion, different requirements for the organization of work, lack of motivation and necessary knowledge, mistrust and apprehension). At the same time, if just over 10 years ago researchers did not believe that the digital gap between the young and the old could be completely eliminated (in general, their predictions have come true, as over the years inequality has only increased due to the high activity of young people) (Darinskaya, Moskvicheva, 2017), now the dynamics of Internet connectivity in all areas of human activity already allows speaking about the refraction of this trend (Chassiakos et al., 2016; Gorelova, Serebrovskaya, 2018; Gruzdeva, 2020).

Conclusion

In the context of increasingly early exposure of children to ICTs, increasing life expectancy, the trend toward digitalization of the economy, social sphere and public administration in the foreseeable future, the entire population will somehow need the opportunity to use at least the Internet, so as not to be excluded from most social processes. In this case we will be able not just to talk about the overall level of the digital divide, but differentiate it at various levels (e.g., basic, user, and professional) for a new understanding of the influence of different factors. This idea requires significant elaboration of the theoretical and methodological framework and constant monitoring of emerging trends in digital development, changes in the regulatory framework, the level of economic and social inequalities among the population, strategic goals in this direction.

The formation of digital equality requires efforts on the part of society (motivation, special skills, etc.), as well as the state, business and non-profit

organizations (training of the population, creation of convenient and accessible online services, etc.). The results of the study are of practical value for the above subjects, in addition, they can be used as part of teaching in higher education, to determine the risk of exclusion from the processes of digital development, formulating the relevance of social programs to retrain the working population for the requirements of new jobs, training older people in digital skills, for management decisions, development of strategic programs by regional and federal authorities, including in as part of the national program "Digital Economy of the Russian Federation".

References

Anderson M., Perrin A. (2017). Tech adoption climbs among older adults: Technology use among seniors. Available at: http://assets.pewresearch.org/wpcontent/uploads/sites/14/2017/05/16170850/PI_2017.05.17_OlderAmericans-Tech_FINAL.pdf

Arkhipova M.Yu., Sirotin V.P., Sukhareva N.A. (2018). Development of a composite indicator for measuring the value and dynamics of digital divide in Russia. *Voprosy statistiki,* 25(4), 75–87 (in Russian).

Berner J., Rennemark M., Jogréus C., Berglund J. (2012). Distribution of personality, individual characteristics and internet usage in Swedish older adults. *Aging and Mental Health,* 16, 119–126. DOI:10.1080/13607863.2011.602958

Bikkulov A.S., Sergeeva O.V. (2016). Personal computer as everyday technology: Empirical research of computer usage among Russian elderly. *Vestnik Nizhegorodskogo universiteta im. N.I. Lobachevskogo. Seriya: Sotsial'nye nauki=Vestnik of Lobachevsky State University of Nizhni Novgorod. Series: Social Sciences,* 2(42), 95–103 (in Russian).

Charness N., Boot W.R. (2009). Aging and information technology use: Potential and barriers. *Current Directions in Psychological Science,* 18(5), 253–258.

Chassiakos Y.J., Radesky D., Christakis M. et al. (2016). Children and adolescents and digital media. *Pediatrics,* 138(5). DOI: https://doi.org/10.1542/peds.2016-2593

Darinskaya L.A., Moskvicheva N.L. (2017). Opportunities of intergenerational interaction when involving the elderly people in the digital environment. *Peterburgskii psikhologicheskii zhurnal=Saint Petersburg Psychological Journal,* 20, 43–65 (in Russian).

Dmitrieva A.V. (2018). Achieving the social inclusion of elderly people: A continuation of employment or 'advanced' leisure? *Zhurnal issledovanii sotsial'noi politiki=The of Social Policy Studies,* 1, 37–50 (in Russian).

Dobrinskaya D.E., Martynenko T.S. (2019). Perspectives of the Russian information society: Digital divide levels. *Vestnik Rossiiskogo universiteta druzhby narodov. Seriya: Sotsiologiya=RUDN Journal of Sociology,* 19(1), 108–120. DOI: http://dx.doi.org/10.22363/2313-2272-2019-19-1-108-120 (in Russian).

Donelle L., Facca D., Burke Sh., Hiebert B., Bender E., Ling S. (2021). Exploring Canadian children's social media use, digital literacy, and quality of life: Pilot cross-sectional survey study. *JMIR Formative Research,* 5. DOI: 10.2196/18771

Ershova R.V. (2019). Digital generation: Between myth and reality. *Filosofskie nauki=Russian Journal of Philosophical Sciences,* 62(2), 96–108. DOI: https://doi.org/10.30727/0235-1188-2019-62-2-96-108 (in Russian).

Gladkova A.A., Garifullin V.Z., Ragnedda M. (2019). Model of three levels of the digital divide: Current advantages and limitations (exemplified by the Republic of Tatarstan). *Vestnik Moskovskogo Universiteta. Seriya 10. Zhurnalistika,* 4, 41–72. DOI: 10.30547/vestnik.journ.4.2019.4172 (in Russian).

Gorelova T.P., Serebrovskaya T.B. (2021). Generation N: The formation of new digital consumers. *Problemy teorii i praktiki upravleniya=International Journal of Management Theory and Practice,* 6, 263–278 (in Russian).

Gruzdeva M.A. (2020). Inclusion of population in digital space: Global trends and inequality of Russian regions. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 13(5), 90–104. DOI: 10.15838/esc.2020.5.71.5 (in Russian).

Khvatov A.E., Vatoropin A.S. (2017). Factors preventing the public from receiving public services in electronic form. *Voprosy upravleniya=Management Issues,* 3, 53–61 (in Russian).

Kuchmaeva O.V., Arkhipova Yu.M. (2021). Digital technologies in everyday life of the Russians. *Voprosy statistiki,* 3, 45–55 (in Russian).

Lelkes O. (2013). Happier and less isolated: Internet use in old age. *Journal of Poverty and Social Justice,* 21(1), 33–46.

Mitzner T., Savla J., Boot W., Sharit J., Charness N., Czaja S., Rogers W. (2019). Technology adoption by older adults: Findings from the PRISM trial. *Gerontologist,* 59(1), 34–44. DOI:10.1093/geront/gny113

Nieminen H. (2016). Digital divide and beyond: What do we know of information and communications technology's long-term social effects? Some uncomfortable questions. *European Journal of Communication*, 31(1), 19–32. DOI: https://doi.org/10.1177/0267323115614198

Ragnedda M. (2018). Conceptualizing digital capital. *Telematics and Informatics,* 35, 2366–2375. DOI: https://doi.org/10.1016/j.tele.2018.10.006

Ragnedda M., Kreitem H. (2018). The three levels of digital divide in East EU countries. *World of Media. Journal of Russian Media and Journalism Studies,* 4, 5–27. DOI: 10.30547/worldofmedia.4.2018.1

Robinson L., Cotten S.R., Ono H. et al. (2015) Digital inequalities and why they matter. *Information, Communication & Society,* 18(5), 569–582. DOI: 10.1080/1369118X.2015.1012532

Safiullin A.R., Moiseeva O.A. (2019). Digital inequality: Russia and other countries in the fourth industrial revolution. *Nauchno-tekhnicheskie vedomosti SPbGPU. Ekonomicheskie nauki=St. Petersburg State Polytechnical University Journal. Economics,* 12(6), 26–37. DOI: 10.18721/JE.12602 (in Russian).

Senokosova O.V. (2018). Problems of labor use and training of the population aged 60 and older. *Professional'naya orientatsiya=Professional Orientation,* 2. Available at: https://cyberleninka.ru/article/n/problemy-ispolzovaniya-truda-i-podgotovki-naseleniya-v-vozraste-60 (in Russian).

Shabunova A.A., Korolenko A.V. (2019). Children's involvement in digital space: Gadgetization trends and threats to human development. *Vestnik Udmurtskogo universiteta. Sotsiologiya. Politologiya. Mezhdunarodnye otnosheniya=Bulletin of Udmurt University. Sociology. Political Science. International Relations,* 3(4), 430–442 (in Russian).

Shakirova G.F. (2017). Interrelations between the psychological climate, social status of families and interpersonal relations of preschool children using digital technologies. *Filologiya i kul'tura=Philology and Culture,* 4(50), 249–252 (in Russian).

Shakirova G.F. (2020). Psychological features of students' gadget addiction. *Kazanskii pedagogicheskii zhurnal=Kazan Pedagogical Journal,* 1(138), 217–223 (in Russian).

Shinyaeva O.V., Poletaeva O.V., Slepova O.M. (2019). Information and digital inequality: Searching for effective population adaptation practices. *Monitoring obshchestvennogo mneniya: Ekonomicheskie i sotsial'nye peremeny=Monitoring of Public Opinion: Economic and Social Changes,* 4, 68–85. DOI: https://doi.org/10.14515/monitoring.2019.4.04 (in Russian).

Shinyaeva O.V., Slepova O.M. (2019). Information digital divide of population: Risk and anti-risk factors. *Izvestiya Saratovskogo universiteta. Novaya seriya. Seriya: Sotsiologiya. Politologiya=Izvestiya of Saratov University. Sociology. Politology,* 19(1), 53–61. DOI: https://doi.org/10.18500/1818-9601-2019-19-1-53-61 (in Russian).

Smirnykh L.I. (2020). Digital literacy of the elderly population and digitalization of enterprises: Experience of European countries. *Voprosy Ekonomiki,* 12, 104–124 (in Russian).

Solomatina V.A. (2020). Digital literacy of young learners. *Vestnik gosudarstvennogo sotsial'no-gumanitarnogo universiteta=Bulletin of the State University of Humanities and Social Studies,* 1(37), 71–74 (in Russian).

Varlamova Yu.A. (2022). The intergenerational digital divide in Russia. *Mir Rossii=Universe of Russia,* 31(2), 51–74. DOI: https://doi.org/10.17323/1811-038X-2022-31-2-51-74 (in Russian).

Volchenko O.V. (2016). Dynamics of the digital divide in Russia. *Monitoring obshchestvennogo mneniya: Ekonomicheskie i sotsial'nye peremeny=Monitoring of Public Opinion: Economic and Social Changes,* 5, 163–182. DOI: 10.14515/monitoring.2016.5.10 (in Russian).

Yates S., Kirby J., Lockley E. (2015). Digital media use: Differences and inequalities in relation to class and age. *Sociological Research Online,* 20(4), 1–21. DOI: 10.5153/sro.3751

Zarubina Yu.N., Vlasova A.A. (2018). Gender inequality in digital society. *Vestnik sotsial'no-politicheskikh nauk=Vestnik Social'no-Politicheskikh Nauk,* 17, 16–20 (in Russian).

Information about the Author

Mariya A. Gruzdeva – Candidate of Sciences (Economics), Senior Researcher, deputy head of department, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: mariya_antonovarsa@mail.ru)

Received July 8, 2022.

DOI: 10.15838/esc.2022.4.82.15
UDC 339.13:330.59, LBC 65.422.2-94

Online Retail in China and Russia: Current State and Development Prospects

Irina N.
DEMENT'EVA
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: irinika_74@mail.ru
ORCID: 0000-0002-3072-5614; ResearcherID: H-4767-2017

SHENG FANGFU
Jiangxi Academy of Social Sciences
Nanchang, China
e-mail: shengff1986@126.com

Abstract. In recent years, due to the digitalization of the economy, there has been a rapid development of online commerce around the world. China is a global leader in online trade; the country demonstrates the highest volumes of the online sales market. The Russian online sales market is the most dynamic, Russia ranks first in terms of the growth rate of online retail. Within the framework of this study, we analyze the current state of online retail trade in China and Russia over the recent years, assess the contribution of e-commerce to the retail turnover of the two countries, identify factors affecting the active and dynamic development of this sector and promising directions for further development of online consumption in the context of modern socio-economic transformations. In the course of the research, we have found that the successful development of online retail in China is the result of an effective system of political regulation and stimulation of this segment, constant expansion and improvement of Internet coverage,

For citation: Dement'eva I.N., Sheng Fangfu. Online retail in China and Russia: Current state and development prospects. *Economic and Social Changes: Facts, Trends, Forecast,* 15(4), 242–261. DOI: 10.15838/esc.2022.4.82.15

improvement of e-commerce infrastructure and people's financial situation. In Russia, the widespread use of the Internet, including on mobile devices, the transformation of consumer attitudes, requests and preferences, the increase in sales volumes of the largest marketplaces and online stores reflect large reserves and great potential for further growth and successful development of this sector. The main directions for further development of the e-commerce segment are as follows: improving the standard of living and quality of life, improving the infrastructure of online commerce, mainly in the direction of ensuring the security of online payments and other transactions, expanding the informatization of rural areas and their population, greening online consumption, improving the regulatory framework in the field of e-commerce.

Key words: digitalization of the economy, online retail trade, coronavirus pandemic, retail turnover, marketplaces, e-commerce infrastructure, standard of living, information technology.

Introduction

Currently, in the context of economic globalization and information technology, there have been certain changes in the way of reaching consumers, Internet commerce has become one of the most dynamically developing economic sectors and a new engine of consumption. In the era of the interconnection of the integrated interaction of "human, machine and things", the space for the development of online commerce is expanding, and its contribution to the national economy and social development is increasing every day. The COVID-19 pandemic and related restrictive measures have led to a fundamental shift in the structure of global demand for online purchases and an increase in the use of digital communication tools and remote consumption, such as social media, Internet telephony, teleconferences, streaming video. The pandemic has transformed consumption patterns and consumer habits, spawned new models and formats of online consumption.

According to research by eMarketer, the global e-commerce market in 2020 amounted to 3.914 trillion U.S. dollars, which is 16.5% more than in 2019[1]. The distribution of sales volumes in the retail segment of e-commerce in ten leading countries of the world shows that China and the United States are unambiguous world leaders in the e-commerce market: they account for about 40% of the market (*Fig. 1*). The volume of the Russian e-commerce market for 2020 amounted to 37 billion U.S. dollars, which is 26 times less than the volume of the Chinese market and 10 times smaller than the U.S. market. However, in terms of annual growth rates, Russia has been a leader: in 2020, its e-commerce market increased by 58%, which indicates the rapid expansion of this sector of the trade industry.

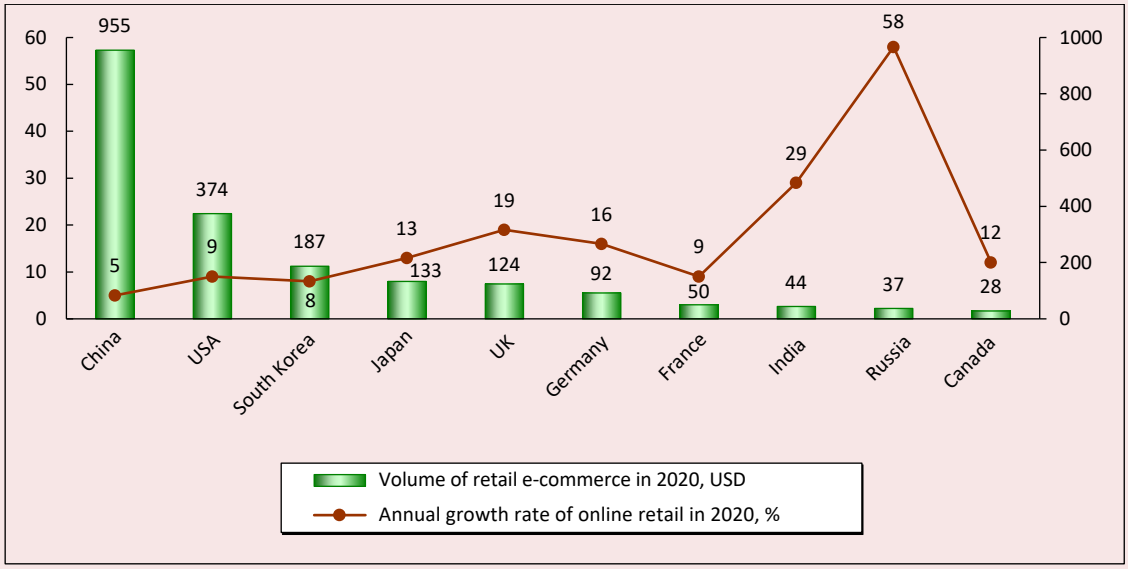
Analysis of studies and publications on the topic

The problems of digitalization of the economy in general and the development of e-commerce in particular have been reflected in the works of international and national research centers, as well as individual scientists.

The largest consulting agencies like BCG, Deloitte, Euromonitor International, McKinsey, and PWC engage in studying major global trends in the behavior of participants in economic activity, including consumers, as well as the social and economic effects arising in this regard. Indicators of digital economy development are presented in analytical reviews of the information agencies Data Insight, East-West Digital News, the Russian Association for Electronic Communications

[1] Global Ecommerce 2020. Available at: https://www.emarketer.com/content/global-ecommerce-2020

Figure 1. Volume and growth of retail e-commerce by country in 2020, billion USD



Source: E-commerce in Russia 2020. Available at: DI_eCommerce2020 (1).pdf

(RAEC), the Association for Internet Commerce Companies (AKIT). These research centers focus on studying the e-commerce market as a whole and individual segments of online commerce, investigate main features of digital consumers, their media preferences, and study channels for promoting goods and services in the online space (Prokhorov, Karashchuk, 2020).

The works of foreign and Russian authors present a wide range of theoretical, methodological and practical aspects related to the analysis of electronic commerce.

Among foreign authors, the works of R. Gläß and B. Leukert have been widely distributed and recognized; the authors talk about the technological revolution in the economy using the trade sector as an example, they analyze the opportunities and threats of introducing innovation technologies at trading enterprises, consider successful models of digital transformation of well-known German and international trading companies (Gläß, Leukert, 2016). K. Schwab describes large-scale changes in all spheres of society, including the digital transformation of the economy during the Fourth Industrial Revolution (Schwab, 2017). J.B. Long, D. Kosiur, J. Weisman, K. Egneberger describe modern electronic business technologies, consider the possibilities of e-commerce in conducting everyday business operations: invoicing, ordering, money transfers, etc. Other researchers analyze the experience of companies that successfully use e-commerce, and highlight related security issues (Kosiur, 1998). S. Klein, S. Kehli, U. Lutti study e-business from the standpoint of marketing; N. Vulkan carries out a detailed economic analysis of various models of e-commerce, assesses their advantages and disadvantages[2]; K. Patel and M.P. McCartin address the problems of strategic management of e-business, analyze the fundamental principles on which the process of electronic transformation of the economy is based (Patel,

[2] Poerov A.S. (2011). Improving the e-commerce system in Russia: Candidate of Sciences (Economics) dissertation abstract. Moscow.

2001). A fundamental work of D.J. Bowersox and D.J. Closs (Bowersox, Closs, 2008) is devoted to the role and content of logistics in modern electronic business. Ph. Treleaven has created a guide for aspiring entrepreneurs to create their own company in the trading business, which will help solve the issues of introducing advanced technologies and allow the company to remain competitive in the new digital economy (Treleaven, 2000).

Among Russian scientists, we can point out the works on the formation of a "new electronic economy" (N.I. Ivanova, V.V. Malyanov, D.A. Chashkin, V.Yu. Shishkov, A.S. Zuev, S.M. Tsirel); research on the role of the Internet in the development of electronic commer ce (V.N. Popov, R.N. Kostyaev, E.N. Kostomarov, I.K. Uspensky, N.P. Ivanov); studies on the world experience in the field of electronic commerce (A.A. Sokolova, N.D. Gerashchenko, A.K. Dvoretsky, M.S. Zelenfroyd, D.A. Kochegarin); legal support for the development of electronic commerce in Russia (N.I. Solovyanenko, A.M. Kastelskaya, G.K. Ekaterinina); problems of electronic business security (V.V. Bykov, V.K. Tsarev, A.K. Dvoretsky); the state of the e-commerce market in Russia (V.K. Ryabtsun, K. Liukhto, V.A. Medvedev)[3].

In general, despite the wide range of problems raised in the works of foreign and domestic researchers, the issues such as assessing the state and prospects for the development of online commerce in the context of the transformation of national socio-economic systems, including under the influence of the global epidemiological crisis, require further research; this served as the basis for our present study.

The purpose of the study is a comprehensive analysis of the state and prospects for the development of online retail in Russia and China. To achieve this goal, it is necessary to implement the following tasks:

– conduct a comparative analysis of the current state of online retail trade in China and Russia over the recent years;

– identify factors affecting the active and dynamic development of this sector;

– identify promising directions for further development of online consumption in the context of modern socio-economic transformations.

The information and empirical base of the study includes official data provided by the Federal State Statistics Service (Rosstat), sociological research of the International Institute for Marketing and Social Research GfK Rus, the research agency in the field of e-commerce Data Insight, information and analytical materials of the National Research University "Higher School of Economics" (NRU HSE), China Commercial Industry Research Institute, the National Bureau of Statistics of China, the Municipal Bureau of Commerce of China.

The research tasks were solved with the help of general scientific methods and techniques (dialectical method, statistical analysis method, generalization, systematization, comparison).

Research findings

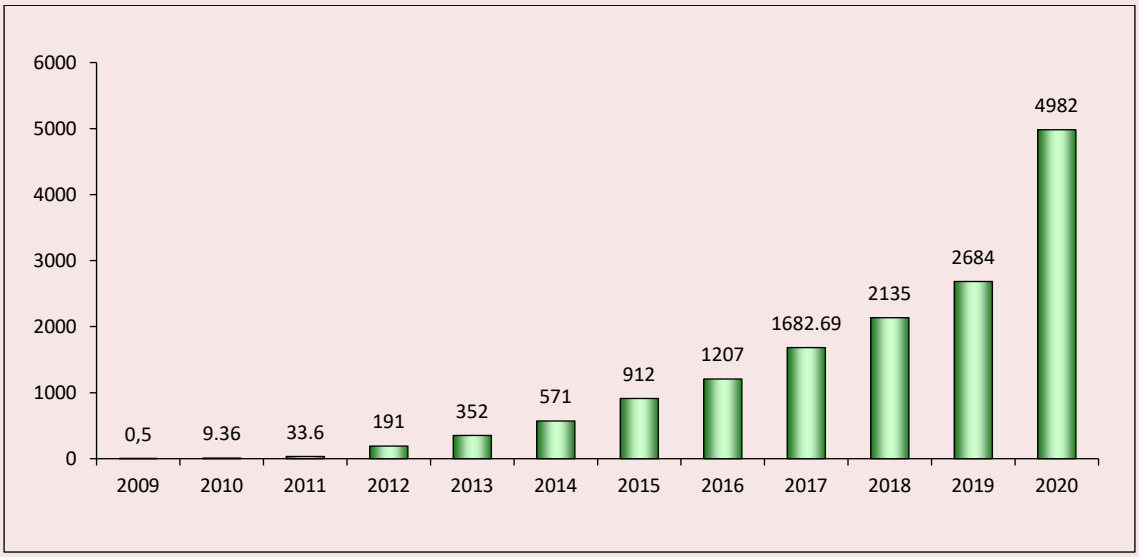
Major online retail trading platforms in China and Russia

According to experts, the modern structure of online retail includes two main forms in which Internet platforms are arranged. These include marketplaces – aggregator sites or specialized intermediaries that automatically collect and process information from various suppliers for different product groups; online stores – websites where you can view information about a product or service of interest and place an order on the Internet (Trofimova, 2018).

[3] Kolodeznikova I.V. (2006). Problems and trends in e-commerce in the global information network Internet: Candidate of Sciences (Economics) dissertation abstract. Moscow.

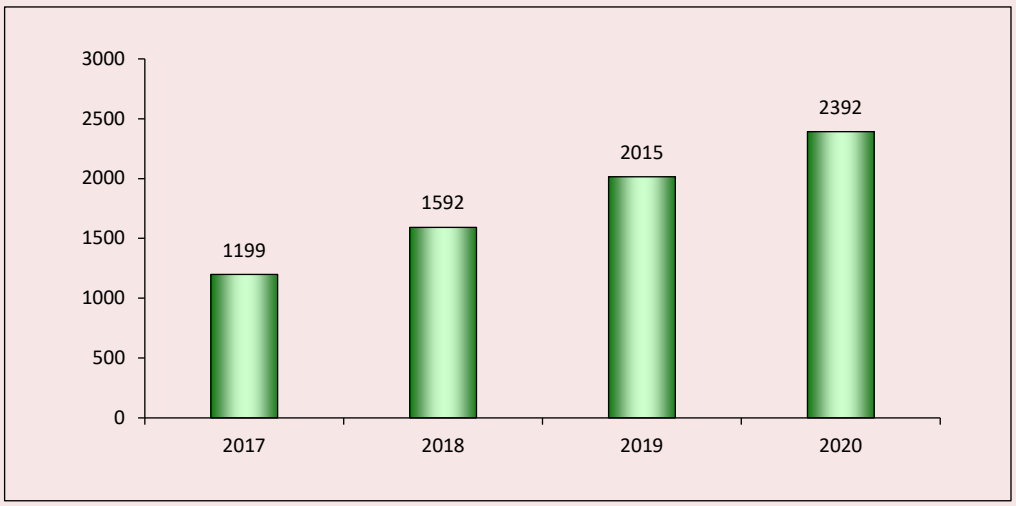
The structure of online retail in China is represented by such platforms as Taobao Mall established in May 2003, JD Mall established in January 2004, Pinduoduo established in April 2015, etc. The consistent creation and rapid development of e-commerce platforms reflect huge demand for the development of online retail. In the process of developing online sales in China, various online platforms have promoted the creation of a number of iconic consumer cultural symbols, such as Taobao Mall's "Double Eleventh Day" starting in 2009, and

Figure 2. Taobao Mall "Double Eleventh Day" transaction volume data from 2009 to 2020, 100 million yuan



Source: China Commercial Industry Research Institute.

Figure 3. Total amount of orders of JD Mall during the "6.18" shopping festival from 2017 to 2020, 100 million yuan)



Note: The data for 2020 represents the cumulative order amount from 0:00 on June 1 to 14:00 on June 18.
Source: China Commercial Industry Research Institute.

JD Mall's "6·18" starting in 2010, etc., having become a carnival for Chinese residents' online consumption. According to the data, during the Double Eleventh Day period in 2020 (11.1–11.11), Taobao Mall's transaction volume was 498.2 billion yuan, JD Mall's cumulative order amount was 239.2 billion yuan; we should also note the transaction volume of e-commerce platforms such as Pinduoduo (*Fig. 2, 3*). The total transaction volume of Chinese consumers during the Double Eleventh Day period may approach one trillion yuan.

In Russia, major marketplaces where most product categories are represented include Wildberries, Ozon, Aliexpress Russia and Yandex. Market. In 2020, the volume of this market niche increased by 108%, up to 721 billion rubles. In total, Russians ordered 405 million goods from these sites with an average sum of one order amounting to 1,780 rubles[4].

According to Data Insight research agency, the rating of the largest online stores in Russia by the end of 2020 is headed by Wildberries with the revenue of 413.2 billion rubles, which is 96% more than a year ago (*Tab. 1*). The second place in the list is occupied by Ozon whose revenue is 197 billion rubles; compared to 2019 it has increased by 144%. Citilink's revenues rose by 47% to 132.7 billion rubles. In 2020, DNS increased online sales by 117%, to 116.7 billion rubles (12 million orders), and M.Video showed a twofold growth, up to 113.2 billion rubles (8.9 million orders). The most popular goods in 2020 on the local market are electronics and household appliances, clothing and footwear, food, furniture and household goods, beauty and health products (Merzlyakova, Bridskii, 2021).

In general, in recent years, both Chinese and Russian online platforms have been rapidly developing and actively increasing sales volumes and the amount of orders.

Table 1. Top 10 most visited Russian e-commerce websites in 2020

#	Store	Category	E-commerce		Orders		Average receipt	
			Million rub.	Increase, in % to 2019	Thousand units	Increase, in % to 2019	Rubles	In % to 2019
1	Wildberries.ru	General stores	413 200	96	305 000	100	1 350	-2
2	Ozon.ru	General stores	197 000	144	73 800	133	2 670	5
3	Citilink.ru	Elelctronics and appliances	132 730	47	12 390	23	10 710	19
4	Dns-shop.ru	Elelctronics and appliances	116 760	117	12 370	82	9 440	20
5	Mvideo.ru	Elelctronics and appliances	113 200	100	8 900	71	12 720	17
6	Eldorado.ru	Elelctronics and appliances	53 760	95	6 400	80	8 400	8
7	Lamoda.ru	Clothing, footwear and accessories	52 970	32	14 550	28	3 640	4
8	Apteka.ru	Health	50 070	46	32 240	48	1 550	-2
9	Aliexpress.ru	General stores	49 000	171	19 060	218	2 570	-15
10	Pokupki.market.yandex.ru	General stores	44 090	136	15 490	159	2 850	-9

Source: Top-100 largest online stores in Russia. Available at: https://www.top100.datainsight.ru

[4] E-commerce in Russia 2020. Available at: DI_eCommerce2020(1).pdf

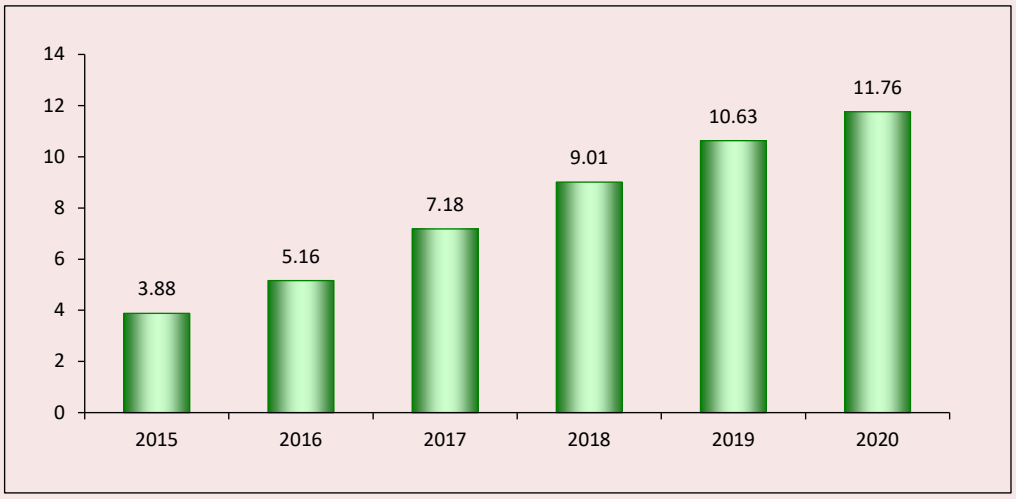
The basic status of online retail in China and Russia

In recent years, online retail in China has demonstrated a rapid expanding trend, it continued its steady growth and increased contribution to the overall retail turnover. The scale of online retail in China is rapidly expanding. In 2020, the volume of online sales in China amounted to 11.76 trillion yuan, which is 3.03 times more than in 2015 (3.88 trillion yuan); the growth of these indicators shows an increase in the scale of this sector (*Fig. 4*). The volume of online commerce in China has increased by one trillion yuan, largely due to the pandemic in 2020.

China's online retail also demonstrates high growth rates. From 2015 to 2020, the average growth rate of China's online retail sales was 23.8%, which is 15.9% higher than the 7.9% average growth rate of total retail sales of consumer goods in China for the same period. In particular, due to the impact of the pandemic in 2020, the growth rate of China's total retail sales of consumer goods decreased by 3.9%, while online retail sales in China, on the contrary, increased by 10.9%, showing high growth rates (*Fig. 5*).

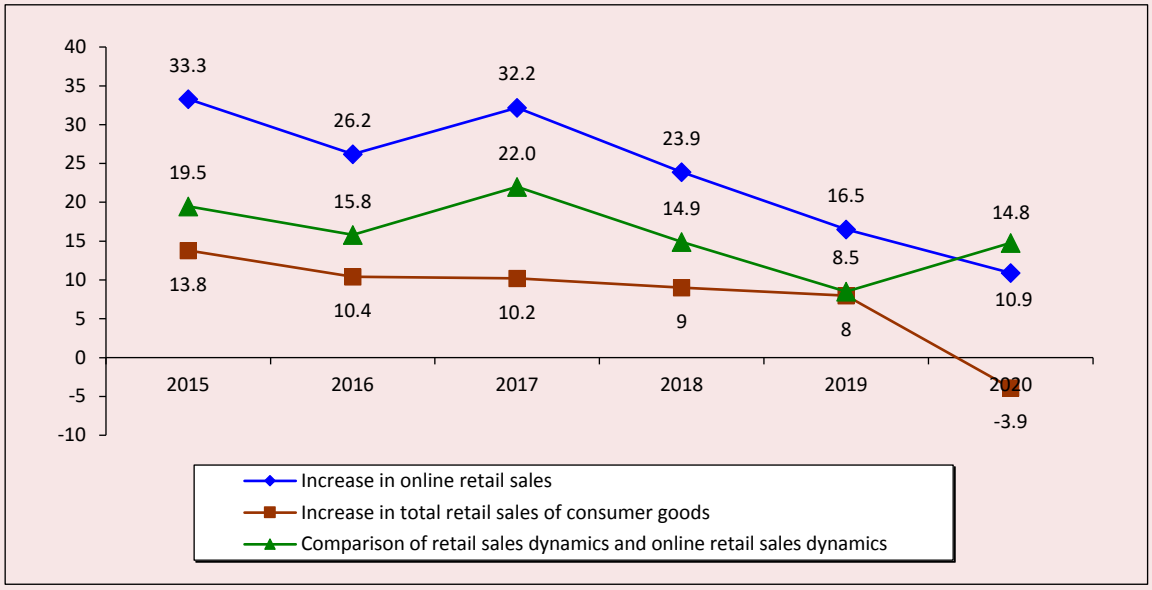
An upward trend in the development of e-commerce is observed in Russia as well. A local online retail system is being formed in the country; the system is being integrated into the global e-commerce system under the influence of globalization processes. According to Data Insight, over the period from 2015 to 2020, the turnover of Russian online commerce increased almost 4.5-fold, amounting to 3.2 trillion rubles (*Fig. 6*). Despite the weak macroeconomic dynamics and the long-term stagnation of people's real incomes, online sales grew rapidly due to the growth of Internet penetration, the arrival of new major players on the market, improved logistics and growing competition. Stagnation of real incomes has become, in a certain sense, one of the main catalysts for the growth of online commerce – due to lower (than traditional retailers) operating costs, online stores were able to offer consumers low prices and more favorable conditions for purchases (delivery, exchange and return of goods, etc.) (Magomedov, 2020). The maximum growth rate (almost 60%) was recorded in 2020 and was due to the impact of the COVID-19 pandemic, which forced people to

Figure 4. China's online retail sales from 2015 to 2020, trillion yuan



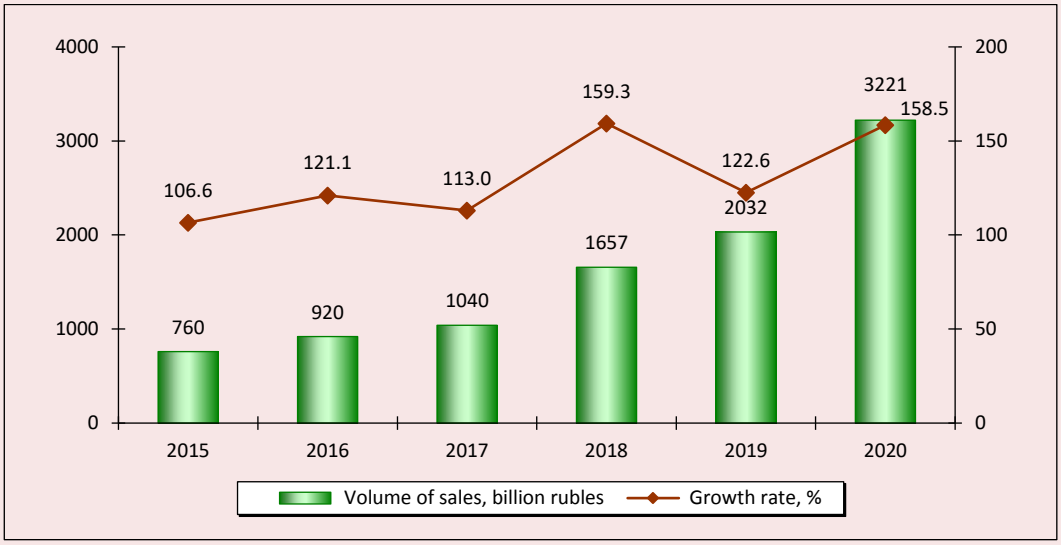
Source: National Bureau of Statistics of China.

Figure 5. Growth of China's online retail sales and retail sales of consumer goods from 2015 to 2020, %



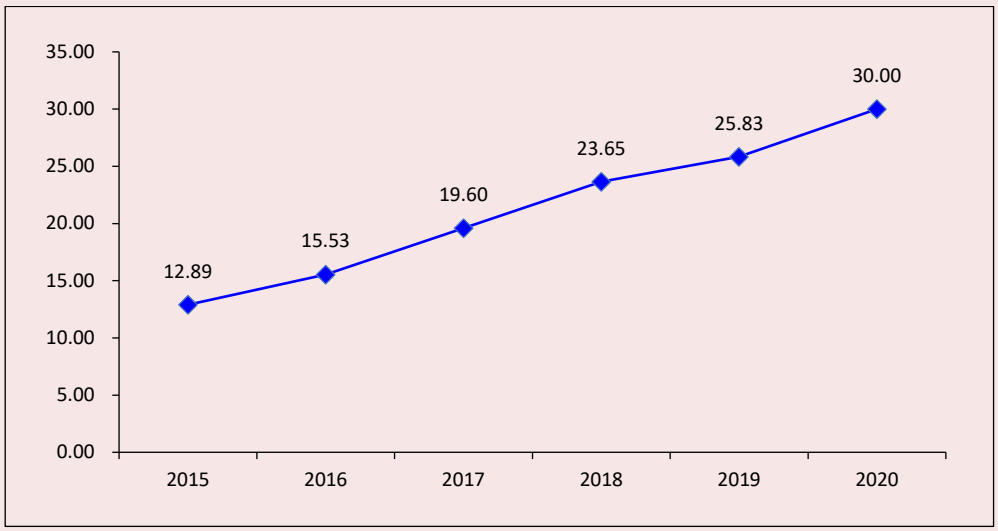
Source: National Bureau of Statistics of China.

Figure 6. Dynamics of the volume of the Russian e-commerce market



Source: Federal State Statistics Service. Available at: https://rosstat.gov.ru/

Figure 7. Proportion of China's online retail sales in the total volume of retail sales of consumer goods in the period from 2015 to 2020, %



Source: National Bureau of Statistics of China.

spend more time at home and order goods online. This has led to the emergence of new opportunities and additional areas of growth for the e-commerce sector as a whole[5].

Contribution of online retail to consumption in China and Russia.

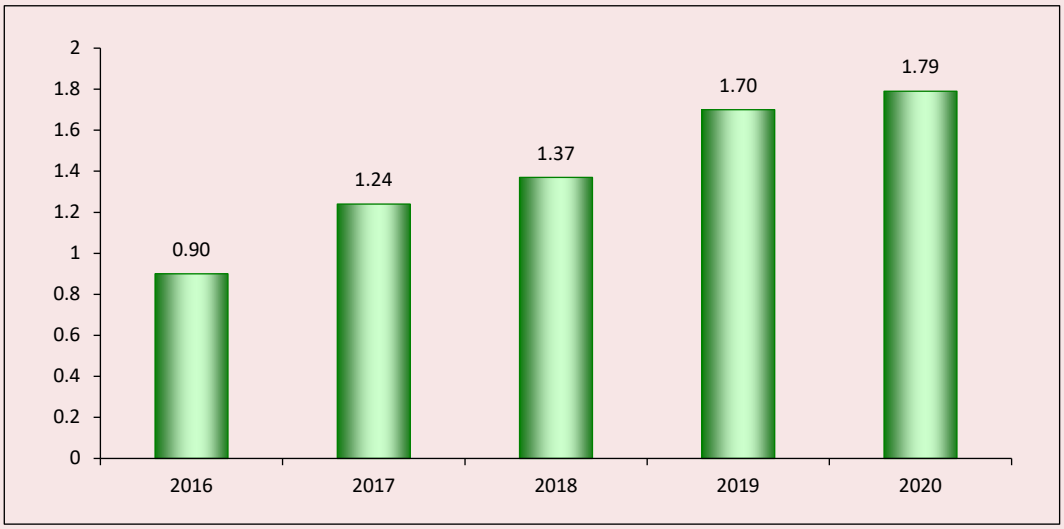
Rapid expansion of online consumption in China and the strong impetus to the development have made online commerce an important engine of national public consumption. In 2020, online retail sales in China accounted for 30% of the total retail sales of consumer goods in the country, an increase of 17% compared to 2015 (13%; *Fig. 7*). In addition, according to China's 14th Five-Year Plan for business development, the volume of retail online sales in the country will reach 17 trillion in 2025, and the share in the total volume of retail sales of consumer goods in the country will increased to 34%.

Particular attention should be paid to the rapid development of online commerce in rural China. By the end of 2020, a comprehensive demonstration of e-commerce in rural areas in China supported 1,338 counties and provided full coverage to 832 national poverty-stricken counties. In 2020, China's rural online retail sales reached 1.79 trillion yuan, which is almost ten times more than in 2014 (180 billion yuan; *Fig. 8*).

Thus, in Xunwu County, Ganzhou City, Jiangxi Province, at the end of 2020, 797 e-commerce companies were registered and more than 3,000 online stores (including mobile phone and computer users) were created, in which almost 40,000 people are engaged in e-commerce and related industries, with the volume of e-commerce transactions reaching 1.028 billion yuan. It is worth noting that in a relatively remote county with a lagging level of economic development, the number of express deliveries to the county amounted to 8236.5 thousand, and from the county – 8297 thousand, while the number of outgoing deliveries

[5] The Consumer Transformed: 2020 Global Consumer Insights Survey: Russia. Available at: https://www.pwc.ru/ru/retail-consumer/publications/assets/pwc-global-customer-insights-survey-2020-russia-ru.pdf

Figure 8. China's rural online retail sales from 2016 to 2020, trillion yuan



Source: Ministry of Commerce of China.

rarely exceeds the number of incoming ones. The development of online retail business has driven the online sales of the county's characteristic and advantageous agricultural products, which has led to an increase in the income of local residents.

Describing the contribution of online retail trade to consumption in Russia, we should note that according to Rosstat, in the period from 2015 to 2020, the share of online sales in retail turnover increased fourfold (from 0.9 to 3.9%), in the period from 2019 to 2020, the share of e-commerce has almost doubled (from 2 to 3.9%), which was largely facilitated by the coronavirus pandemic (*Tab. 2*). At the same time, experts point out that despite the significant growth, online commerce does not play a decisive role in the country's retail turnover, this indicator is several times less than the global average (15.7% in 2020). In a number of large countries, the penetration rate of online commerce already exceeds 20%. Among European countries,

Table 2. Dynamics of the share of Internet sales in the total retail turnover in RF federal districts (in actual prices, in %)

Federal district	2015	2016	2017	2018	2019	2020
Russian Federation	**0.9**	**1.2**	**1.3**	**1.7**	**2.0**	**3.9**
Central Federal District	1.2	2.0	2.1	2.7	3.2	6.1
Northwestern Federal District	0.9	1.0	1.2	2.5	2.7	4.4
Southern Federal District	0.5	0.6	0.6	0.6	0.9	4.3
North Caucasian Federal District	0.1	0.1	0.2	0.3	0.3	0.8
Volga Federal District	0.6	0.6	0.7	0.8	1.1	3.0
Ural Federal District	1.0	1.1	1.1	1.3	1.3	4.2
Siberian Federal District	1.4	1.4	1.4	1.7	1.9	3.8
Far Eastern Federal District	0.5	0.6	0.6	0.4	0.4	1.5
Source: Federal State Statistics Service. Available at: https://rosstat.gov.ru/						

the leaders in the development of e-commerce in retail are the United Kingdom, Germany, Denmark, the Netherlands (15–20%)[6]. As mentioned above, in China, the share of the online segment in retail trade is 30%.

Official statistics data in the context of RF federal districts also confirm that regional e-commerce is insufficiently developed and has large reserves for further growth (see Tab. 2). The leaders among the macro-regions of the Russian Federation are the Central and Northwestern federal districts (6.1 and 4.4%, respectively). Moreover, in these regions, the development of online commerce is determined by the influence of large cities such as Moscow and Saint Petersburg. These regions are currently the drivers of the development of e-commerce in Russia (Li Zhimeng, 2020; Krasil'nikova, 2019). In general, there is a significant potential for the growth of e-commerce in the coming years, including by increasing the level of penetration and replacing traditional retail formats.

Factors determining the development of online retail in China and Russia

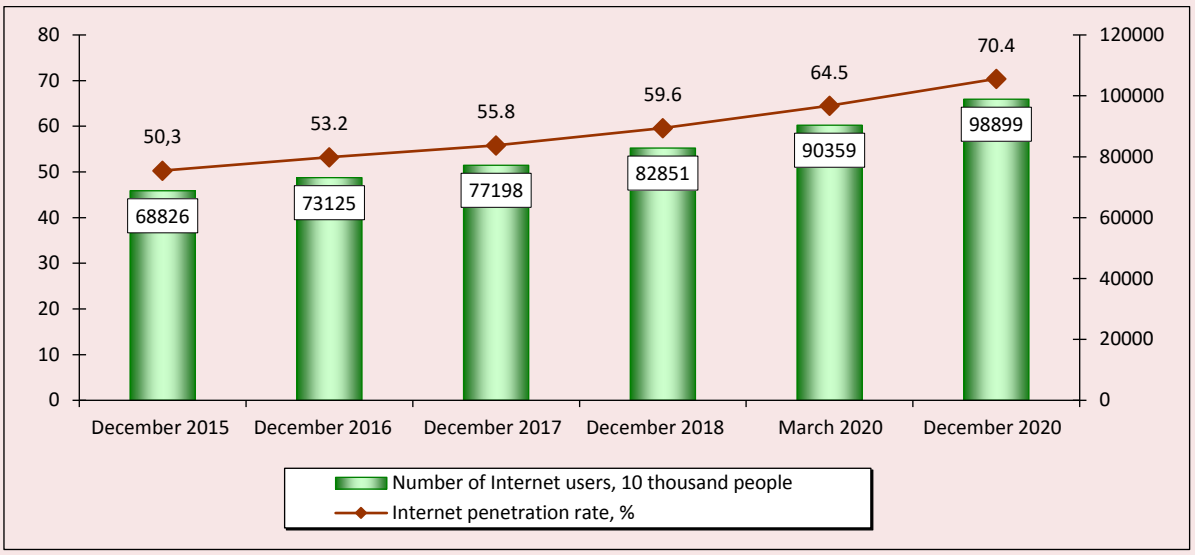
Based on numerous studies and expert opinions, we can highlight several reasons for the rapid development of online retail in China.

First, creating an integral system for governmental regulation of electronic commerce. The emergence and development of new types of business is the result of the internal drive of the market, which, in turn, requires policy guidance, encouragement and regulation. China has successively introduced a series of related policies, such as the "Opinions of the State Council on Vigorously Developing E-commerce and Accelerating the Cultivation of New Economic Impetus" "Guiding Opinions on Promoting the Healthy and Rapid Development of Cross-border E-commerce", "Guiding Opinions of the State Council on Actively Promoting the "Internet +" Action", "Action Outline for Promoting the Development of Big Data", "Opinions of the General Office of the State Council on Promoting Online and Offline Interactions and Accelerating the Innovative Development, Transformation and Upgrading of Commercial Circulation", "Guiding Opinions of the General Office of the State Council on Promoting the Accelerated Development of Rural E-commerce", "Opinions of the General Office of the State Council on the Deep Implementation of the 'Internet + Circulation' Action Plan", etc., especially after the outbreak of the pandemic, in order to stimulate consumption, China promulgated the "Opinions of the General Office of the State Council on Guiding the Accelerated Development of New Types of Consumption with New Business Types and Models" (G.B.F.(2020) No. 32) and the "Implementation Opinions on Promoting Expansion and Quality Improvement of Consumption and Accelerating the Formation of a Strong Domestic Market" (F.G.J.Y.(2020) No. 293), etc., having provided strong policy support for the recovery and development of China's online retail industry.

Second, continuous increase in the rate of Internet penetration. The number of Chinese netizens increased from 688 million at the end of 2015 to 989 million at the end of 2020. In general, China's Internet users account for about a fifth of global network users; the Internet penetration rate increased from 50.3% to 70.4% (*Fig. 9*). In December 2020, there were 986 million mobile Internet users in China, of which 99.7% used mobile phones (*Fig. 10*). These large amounts of Internet users and mobile Internet users have provided a huge source of power for online shopping.

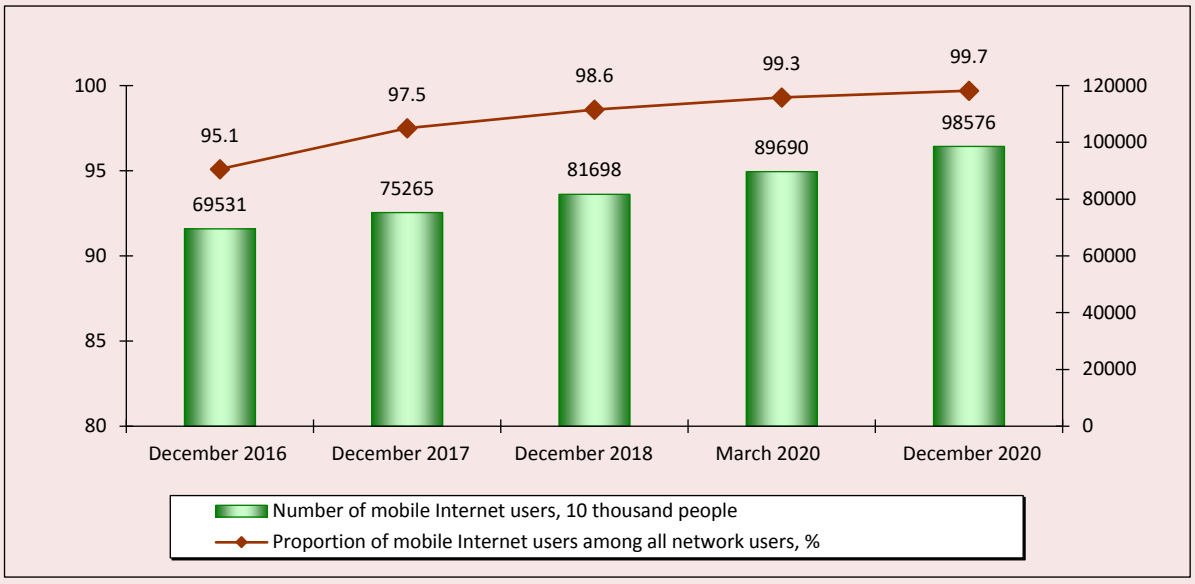
[6] Russian e-commerce market: Results of 2019, trends of 2020. Available at: file://fs/usefold/ind/Downloads/niu_vshe.pdf

Figure 9. Scale of Chinese netizens and the Internet penetration rate from 2015 to 2020



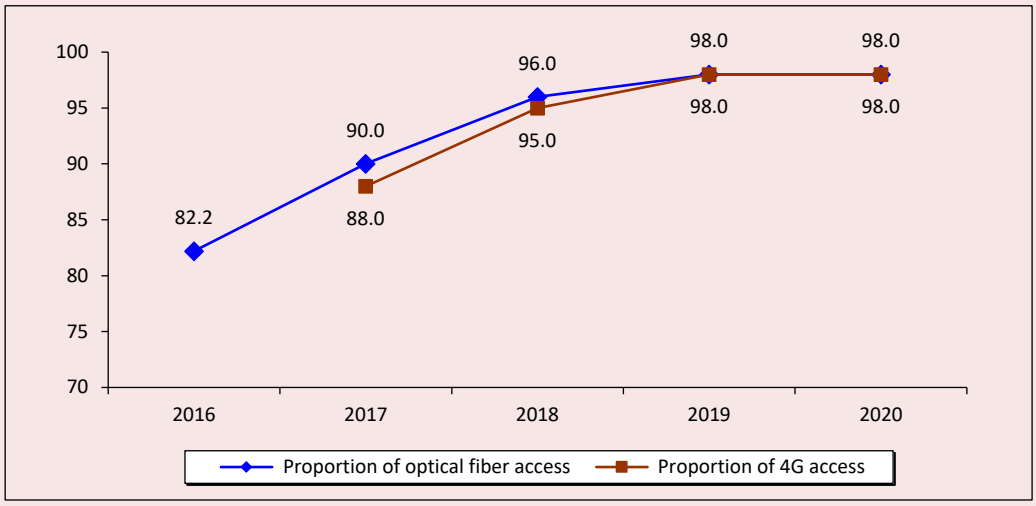
Source: Statistical survey on the development of the Internet in China.

Figure 10. Number of mobile Internet users in China and their share among all Internet users in the period from 2016 to 2020



Source: Statistical survey on the development of the Internet in China.

Figure 11. Growth of optical fiber and 4G access in China's administrative villages from 2016 to 2020



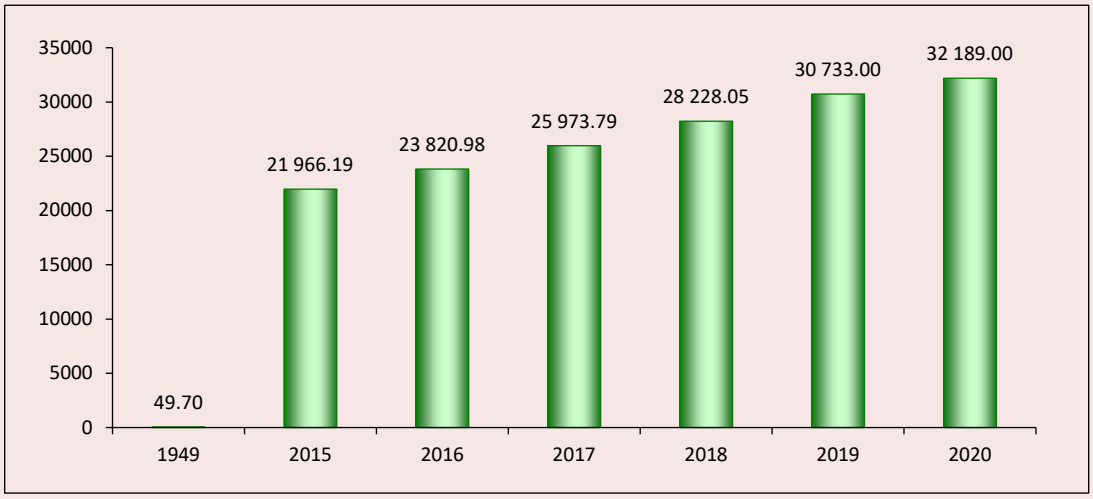
Source: Digital China Development Report (2020).

Third, infrastructure improvement. A complete network and modern transportation infrastructure are important prerequisites for supporting online retail. By the end of 2020, the access to optical fiber and 4G in China's administrative villages has reached 98%, which is 8% and 10% respectively higher than in 2017 (*Fig. 11*). By the end of 2020, there were more than 2,000 e-commerce and logistics distribution centers at the county level and more than 130,000 online retail service stations at the village level across the country. Also, express delivery outlets covered more than 30,000 townships/towns across the country, with a coverage rate of 97.6%, and 27 provinces (districts, cities) achieved full coverage of express delivery outlets in towns and villages.

For example, by the end of 2020, Jiangxi Province has achieved full coverage of high-speed railways in 11 district-divided cities, expressways in 84 counties (cities), power and electricity in 16 thousand administrative villages, and cement (asphalt) roads in 169 thousand natural village groups; the narrowband Internet of Things has reached full coverage in Jiangxi Province and 5G base stations have achieved full coverage of major urban areas in 11 district-divided cities.

Fourth, an increase in the income level of urban and rural residents. Income is a prerequisite for consumption. The Chinese Government attaches great importance to improving people's living standards, considers raising people's living standards as a starting point and basis for all the relevant efforts, and adheres to the orientation of economic development toward employment. Since the founding of the People's Republic of China, especially the reform and opening up, the income of the urban and rural population has grown significantly, and the consumer opportunities of residents have also increased: from the lack of basic necessities to a comprehensively prosperous society. Thus, the country defeated poverty with integrated measures. In 2020, the per capita disposable income of Chinese residents reached 32,189 yuan, which is 648 times more than in 1949. The increase in people's income level provides a source for online consumption (*Fig. 12*). According

Figure 12. Changes in per capita disposable income of Chinese residents



Source: National Bureau of Statistics of China.

to the UN standard, China is a prosperous and rich country, since the Engel coefficient (the share of total food expenses in personal consumption expenditures) in 2020 among Chinese residents was 30.2%, in urban areas – 29.2%, and in rural areas – 32.7%.

In general, the development of online retail in China is the result of an effective system of political regulation and stimulation of this segment, continuous expansion and improvement of Internet coverage in China, improvement of infrastructure and the financial situation, and increase in people's incomes.

Using the data of scientific and statistical sources, we can identify a number of factors affecting the development of online commerce in Russia.

First of all, we should note that in recent years the Russian state has been taking serious measures to regulate and improve online commerce. In 2017, the Program "Digital economy of the Russian Federation" was adopted. It sets out the goals, objectives, and directions of state policy for development of the digital economy in Russia, and sets deadlines for their implementation. According to the Program, by 2024, it was planned to provide 97% of households in the Russian Federation with broadband Internet access (100 Mbit/s). In all major cities with a population of 1 million or more, it was planned to provide stable coverage of the 5G network and above. In Russia, it was planned to create ten enterprises that occupy leading positions in the field of high technology, as well as ten digital platforms for servicing the main sectors of the economy, including the trade sector[7].

The most important document for the e-commerce sector is the "Strategy for development of e-commerce in the Russian Federation for the period up to 2025" elaborated by the RF Ministry of Industry and Trade; the Strategy defines conceptual vectors for development of the Russian e-commerce market for the next decade. According to the Strategy, the share of electronic commerce in the total volume of Russian trade in 2025 will

[7] Digital Economy of the Russian Federation. Available at: http://government.ru/media/files/9gFM4FHj4PsB79I5v7yLVuPgu4bvR7M0.pdf].

Table 3. RF households that have Internet access, % of the total number of households

Indicator	2015	2016	2017	2018	2019	2020
Proportion of households with Internet access in the total number of households	72.1	74.8	76.3	76.6	76.9	80.0
Proportion of households with broadband Internet access in the total number of households	66.8	70.7	72.6	73.2	73.6	77.0
Proportion of the population with access to the Internet using mobile devices (mobile phones or smartphones, e-book readers, PDAs)	41.4	48.9	56.0	61.9	65.9	70.7
Proportion of the population who used the Internet to order goods and (or) services in the total population	19.6	23.1	29.1	34.7	35.7	40.3
including						
urban areas	22.5	26.5	32.6	38.3	39.6	45.1
rural areas	10.6	12.9	18.4	23.7	23.8	25.8
Source: Federal State Statistics Service. Available at: https://rosstat.gov.ru/statistic						

reach 20%. It is assumed that 70% of retail stores (mainly small and medium-sized entrepreneurs) will use Internet channels. At the same time, the share of the Russian Federation in the global e-commerce market will be at least 10% (Minakova et al., 2020). These regulations allow us to point out that in Russia the need to create a set of favorable regulatory, organizational and technical conditions for the development of the online trade sector, stimulating the business activity of e-commerce participants, creating a competitive environment and creating a comfortable consumer climate for the population is defined at the highest legislative level (Zhilina, 2018).

As mentioned above, the most important factor in the dynamic development of e-commerce around the world, including Russia, is the active introduction of information technology. Special surveys of the Russian Internet audience show that in the period from 2015 to 2020, the share of households with Internet access increased by 8 percentage points, from 72 to 80%, broadband access – by 10 percentage points, from 67 to 77% (*Tab. 3*). The most significant leap forward is observed in the segment of mobile device usage: the audience of Internet users on mobile phones, smartphones, etc. increased by 30 percentage points, from 41 to 71%, respectively. In the regional context, Moscow and Saint Petersburg remain leaders in terms of Internet penetration, but gradually the differences between the regions in this indicator are being smoothed out[8].

The wide and dynamic spread of the Internet has great potential for involving people in online shopping. In 2020, with the share of Russian households with Internet access at 80%, the proportion of the population using this channel for online shopping was only 40%. During the period under consideration from 2015 to 2020, there was an uneven increase in the involvement of residents in online purchases, depending on the territory of residence: the difference in the growth of this indicator in urban and rural areas was about 10% in favor of the city (Sovetova, 2021). This reflects the large reserves available for the further development of online commerce in Russia: expansion of the audience of online buyers, involvement of people already connected to the Internet to make purchases online, including in rural areas.

[8] Russian e-commerce market: Results of 2019, trends of 2020. Available at: file://fs/usefold/ind/Downloads/niu_vshe.pdf

Another important driver of online retail development in Russia is the new consumer attitudes and preferences that have been emerging in recent years. Among modern global consumer trends, experts name "the desire to consume high-quality and safe goods and services; conscious choice and orientation toward the conformity of goods with consumer values; strengthening consumer interaction, sharing consumer experience through social media"[9]. Of no small importance is the fact that the preferences of modern consumers have changed toward individualization of consumption (Belyakov et al., 2020). Consumers are increasingly demanding only products and services that meet their specific needs, trying to make them the subject of self-expression, personal identification (individualization of the need), as well as the most appropriate way to meet the need (individualization of service) and time (delivered only when the consumer wants them – individualization of the time of satisfaction of the need) (Vorobyev, 2015). According to a KPMG study, 56% of online store visitors expect retailers to take an individual approach to the customer and consider excellent service to be the most important factor in increasing customer loyalty. When deciding which brand to choose and which retailer to purchase from, Russians take into account the possibility of making purchases around the clock (59%), convenience and ease of use (53%), availability of real-time delivery information (49%)[10]. Such a transformation of consumer needs and preferences encourages entrepreneurs to make significant changes in the way they engage in trade, including digitalization of many of their services, expansion and improvement of online trading.

In general, the main obstacle to the development of e-commerce in Russia is the lack of Internet coverage in various localities and regions, lack of technical means and opportunities to use the Internet in remote areas, including rural areas, which creates imbalances in the development of this economic sector. In addition, despite the formation of new consumer attitudes, certain restrictions on online consumption are associated with Russians' mentality: many buyers are still not ready to abandon making purchases in traditional stores and completely shift to online shopping, physical contact is still important to strengthen confidence in the product and the manufacturer (Dement'eva, 2021).

Major directions for further development of online commerce in China and Russia

Despite the different current level and pace of development of national markets, it is possible to identify areas of further development of online retail trade that are relevant for China and Russia.

First, the most important direction that promotes the development of domestic demand and the growth of online consumption is to create conditions for the growth of people' incomes and to meet their basic socio-economic needs as a foundation for ensuring purchasing activity and expanding the material possibilities of using e-commerce technology. Income is a prerequisite for consumption, and stable and predictable income growth is an important basis for ensuring the effective use of consumer potential. The increase in the purchasing power of the population's income is directly related to the stabilization of the situation on the labor market, the solution of employment problems. An important role belongs to the increase in residents' property income, especially for rural residents through the implementation of

[9] Demidov A.M. Global trends and the Russian consumer 2017. Available at: www.gfk.com/fileadmin/user_upload/dyna_content/RU/Documents/Press_Releases/2017/Gfk-Global-Russian-Trends-Sep_2017_Report.pdf/

[10] Survey of online shoppers' preferences in 2017. Available at: https://assets.kpmg.com/content/dam/kpmg/ru/pdf/2017/03/ru-ru-the-truth-about-russian-online-consumers.pdf

the rural revitalization strategy. The improvement of the social security system is also essential. The expansion of consumer activity of the population is based on a sense of stability and confidence in the future, which requires a reliable social security system, namely, improving housing conditions, medical care, pensions, etc.

Second, it is necessary to optimize the infrastructure and the online consumption environment. Online consumption is a system-wide project that includes creating a network infrastructure, modern logistics infrastructure, and a safe consumption environment. This requires an integrated approach to optimize and improve the entire chain and the whole consumption process. The necessary steps in this direction may be as follows: to develop mobile retail further by creating and significantly improving Internet applications for mobile devices, to increase the volume of development of such software products by trade enterprises; to carry out timely restructuring of online store sites for convenience and ease of use for customers (Matuzenko et al., 2021); to optimize the goods delivery system; to improve payment forms by increasing the construction of intelligent service terminals and to develop contactless transaction services in order to ensure the security of online payments, including the safety of personal data.

All of the above will contribute to expanding the offer of online services in the retail sector and increasing involvement in online consumption.

Third, reducing the gap in online consumption between urban and rural areas. As mentioned above, in China and in Russia, there is insufficient coverage of rural areas by Internet connection; this fact limits the ability of rural residents to make purchases using e-commerce channels. In this regard, the experience of China is noteworthy: on the one hand, the level of Internet penetration in China is constantly expanding, and on the other hand, the infrastructure of online commerce in rural areas is being improved. Logistics sorting centers created at the county level focus on warehousing, LTL transportation, express delivery, e-commerce, postal services, deliveries, marketing and other business formats. With the support of postal express delivery and supply and marketing points, the "Internet + four party logistics" supply and marketing collection and distribution model is being promoted, it is aimed at facilitating the construction of comprehensive service outlets in remote settlements, rural areas, as well as the creation and improvement of a two-way unimpeded logistics distribution network between urban and rural areas, in order to stimulate the potential of consumption in rural areas.

Fourth, promoting the eco-friendly development of online retail. In the process of online retail, a large amount of packaging material is used, therefore it is especially important to implement green recycling of express parcels. It is necessary to research, develop and use environmentally friendly packaging materials, increase the intensity of recycling, and minimize the amount of waste.

Fifth, we should mention that the need to improve the legal framework for regulating this segment is a long-term direction for the formation of upward trends in the development of Internet sales in Russia. According to experts, the regulatory framework of online commerce in Russia is in the process of formation and requires significant improvement. First of all, this concerns reducing the risks accompanying transactions and ensuring cybersecurity. The state should pay close attention to improving the identification and authentication of interacting agents, protection against unauthorized access, falsification of documents, etc. A unified concept of e-commerce infrastructure formation should be created with clearly defined goals, objectives, and tools used (Minakova et al., 2020).

Conclusions

In recent decades, under the influence of globalization and digitalization of the economy, the world e-commerce system has been actively developing. China is the absolute leader in online commerce in the world; the country demonstrates the most significant volumes of the Internet sales market: in 2020 it amounted to 955 billion U.S. dollars, which corresponds to 6.7% of China's GDP. As of 2020, Russia is among the top 10 largest markets and ranks 9th with the volume of its e-commerce market amounting to 37 billion U.S. dollars, which is 2.5% of its GDP. At the same time, considering the dynamic changes, we can say that the Russian Internet sales market is the most actively developing and rapidly growing. In 2020, Russia ranked first the world in terms of the growth rate of online retail: this figure was 58% (in China – 5%).

E-commerce in China and Russia is developing under the influence of global trends facilitated by such important factors as the spread of information technology and the Covid-19 pandemic. In recent years, of key importance for the development of e-business in the retail sector has been the spread of broadband Internet, providing high-speed data transmission and the formation of global networks based on ICT. The Internet has become a platform for making transactions for the purchase and sale of electronic content and tangible goods, opening up new opportunities for both sellers and buyers. In the period from 2015 to 2020, the number of Internet users in China increased by 40% (from 688 to 989 million people), in Russia – by 15% (from 114 to 131 million people).

The coronavirus pandemic acted as a catalyst for the development of distance trading. The economic downturn against the background of coronavirus, quarantine restrictions and the transformation of lifestyle and consumer behavior contributed to a sharp and thorough transition to the use of the latest technology in retail (Belyakov, 2020). Thus, in 2020, the largest Chinese platforms Taobao Mall, JD Mall, and Pinduoduo increased the volume of transactions and the number of orders several times. There is a rapid growth of online commerce in rural areas of China. Universal Russian marketplaces Wildberries, Ozon, Aliexpress Russia and Yandex.Market are also rapidly increasing their sales volumes.

The reasons for the differences in the current state of the national e-commerce markets in China and Russia are as follows: uneven Internet coverage in various regions and localities of the Russian Federation, insufficient quality of Internet communication in remote territories of Russia, Russians' mentality associated with adherence to traditional formats of purchasing goods and services. Certain risks associated with the development of electronic commerce are high dependence on IT technology, the risk of fraud and the need to ensure information security, the need for significant investments in logistics infrastructure, changes in the structure of employment and qualification requirements for the workforce in the trade sector, potential risks of reducing the competitiveness of small and medium-sized trade business.

Promising areas of increasing consumer demand in the e–commerce segment, contributing to its further development, include:

– improving people's living standards, quality of life and the purchasing power of income;

– improving infrastructure, mainly in the direction of ensuring the security of online payments and other transactions, including personal information;

– increased Internet coverage of various localities and regions;

– informatization of rural areas and their population, reducing the gap in online consumption between urban and rural areas;

– making online consumption eco-friendly;

– implementing organizational, informational, technical support from the state, improving the regulatory framework in the interests of enterprises involved in the field of e-commerce, as well as consumers.

The long-term trends in the development of e-commerce in China and Russia will largely depend on the global economic situation, the epidemiological situation, the state of national economies, and the effective social policy of the state.

References

Belyakov S.A., Eirikh V.E., Stepina I.O. (2020). Changing consumer behavior and marketing trends, changes after the COVID-19 pandemic. *CITISE,* 3(25), 363–373 (in Russian).

Bowersox D.J., Closs D.J. (2008). *Logistical Management: The Integrated Supply Chain Process*. McGraw-Hill College.

Dement'eva I.N. (2021). Internetization of consumption in the region in the context of socio-economic uncertainty. *Aktual'nye problemy ekonomiki i menedzhmenta*, 3(31), 34–47 (in Russian).

Gläß R., Leukert B. (2016). *Handel 4.0: Die Digitalisierung des Handels - Strategien, technologien, Transformation*. Berlin.

Kosiur D. (1998). *Understanding Electronic Commerce*. Microsoft Corporation.

Krasil'nikova E.A. (2019). Regions driving e-commerce development in the Russian Federation *Problemy teorii i praktiki upravleniya=International Journal of Management Theory and Practice,* 11, 22–34 (in Russian).

Li Zhimeng, Lukin E.V., Sheng Fangfu, Zeng Wenkai (2021). Assessing the impact of the COVID-19 pandemic on the economies of China and Russia *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 14(5), 277–299 (in Russian).

Magomedov A.M. (2020). Pandemia, online trade and online store promotion. *Marketing v Rossii i za rubezhom=Journal of Marketing in Russia and Abroad*, 5, 35–43 (in Russian).

Matuzenko E.V., Glazunova O.A., Izvarin A.A. (2021). Trends, problems and prospects for the development of electronic commerce in the sphere of Internet trade. *Vestnik Belgorodskogo universiteta kooperatsii, ekonomiki i prava= Herald of the Belgorod University of Cooperation, Economics and Law,* 1, 197–206 (in Russian).

Merzlyakova E.A., Bridskii E.V. (2021). The main trends and promising directions of e-commerce development in Russia. *CITISE,* 2(28), 510–522 (in Russian).

Minakova I.V., Raspopin D.I., Bykovskaya E.I. (2020). Opportunities and limitations of development of internet trade in Russia. *Fundamental'nye issledovaniya=Fundamental Research,* 5, 136–142 (in Russian).

Patel K. (2001). *Secrets of Success in Electronic Business*. New York.

Prokhorov Yu.N., Karashchuk O.S. (2020). Retail internet trade in Russia: Standing, trends and further development. *Vestnik REU im. G.V. Plekhanova=Vestnik of the Plekhanov Russian University of Economics,* 5(113), 196–206 (in Russian).

Schwab K. (2017). *The Fourth Industrial Revolution*. New York: Crown Business.

Sovetova N.P. (2021). Rural territories' digitalization: From theory to practice. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 14(2), 105–124 (in Russian).

Treleaven Ph. (2000). *E-Business Start-Up. The Complete Guide to Launching Your Internet and Digital Enterprise*. London: Kogan Page.

Trofimova V.V. (2018). Developing internet trading in Russia and in the world. *Biznes-obrazovanie v ekonomike znanii,* 2, 73–76 (in Russian).

Uskova T.V. et al. (2013). *Problemy ekonomicheskogo rosta territorii* [Problems of Economic Growth of the Territory]. Vologda: ISERT RAN.

Vorobyev K.Yu. (2015). Essence of e-commerce in the system of international trade relationships. *Rossiiskii vneshneekonomicheskii vestnik=Russian Foreign Economic Journal,* 3, 106–114 (in Russian).

Zhilina I.Yu. (2018). Electronic retail in Russia: Status and prospects. *Ekonomicheskie i sotsial'nye problemy Rossii,* 1, 39–70 (in Russian).

Information about the Authors

Irina N. Dement'eva – Researcher, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: irinika74@mail.ru)

Sheng Fangfu – Master, Researcher, Jiangxi Academy of Social Sciences (649, North Hongdu Avenue, Nanchang, 330077, Jiangxi Province, China; e-mail: shengff1986@126.com)

Received March 22, 2022.

DOI: 10.15838/esc.2022.4.82.16
UDC 332.1, LBC 65

Economy, Standard of Living and Quality of Life in the Region (Reflections on the Dictionary-Reference Book *Regional Economics* Vologda Research Center of the Russian Academy of Sciences[1])

Vyacheslav N.
BOBKOV
Institute of Socio-Economic Studies of Population – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Plekhanov Russian University of Economics
Moscow, Russian Federation
e-mail: bobkovvn@mail.ru
ORCID: 0000-0001-7364-5297; ResearcherID: U-6527-2019

Nikolay V.
BOBKOV
A.I. Yevdokimov Moscow State University of Medicine and Dentistry
Moscow, Russian Federation
e-mail: bobkovnv@bk.ru
ORCID: 0000-0002-1144-7890; ResearcherID: GNM-9460-2022

Tatiana V.
CHASHCHINA
e-mail: Chashinatv@mail.ru
ORCID: 0000-0002-3384-3413; ResearcherID: GQH-0078-2022

[1] Ilyin V.A., Shabunova A.A. (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M. 358 p.

For citation: Bobkov V.N., Bobkov N.V., Chashchina T.V. (2022). Economy, standard of living and quality of life in the region (reflections on the dictionary-reference book *Regional Economics* Vologda Research Center of the Russian Academy of Sciences). *Economic and Social Changes: Facts, Trends, Forecast,* 15(4), 262–279. DOI: 10.15838/esc.2022.4.82.16

Abstract. At the new stage of Russia's development, it becomes especially important to find solutions to urgent economic and social issues of regional development so as to ensure full economic sovereignty and decent living standards and quality of life for Russian citizens. The article discusses the issues related to increasing the role of scientific support in addressing these problems through the prism of a notable scientific and practical phenomenon – the publication of the dictionary-reference book *Regional Economics* in 2021; the book was prepared by a team of authors at RAS Vologda Research Center and contains the results of the 30-year work of VolRC RAS on providing scientific and practical support to regional and local authorities of the Vologda Oblast, which contributed to the development of the region's economy, raising the standard of living and improving the quality of life. The published scientific and practical methods for solving regional demographic, economic and social problems and improving the performance of regional and local government bodies represent the main achievements of the book. The article shows that theoretical, methodological and practical solutions to topical regional issues, using the example of the Vologda Oblast, provide scientific and practical communities of other Russian regions with tools for addressing similar problems, taking into account Russia's spatial features. We outline a number of considerations to develop the theoretical, methodological and practical base of the book so that its methods could be applied creatively in other regions of Russia.

Key words: dictionary-reference book, regional economy, economic sphere of the region, social sphere of the region, regional management, effectiveness of budget regulation, production, scientific, technological and human resources potential, tourism and development, demography, human potential, quality of life of the population, management of regional and municipal socio-economic systems, management of inter- and intraregional socio-economic communications, methodology.

Introduction

The federal structure of the Russian Federation is based on its state integrity, the unity of the state authority system, the delimitation of subjects of competence and powers between the Russian state authorities and the state authorities of Russia's entities, equality and self-determination of peoples in Russia[2]. Currently, there are 85 constituent entities of the Russian Federation.

The federal structure of the Russian Federation provides for the conduct of the Russian Federation, the joint conduct of the Russian Federation and Russia's entities. Out of bounds of the conduct of the Russian Federation and the powers of the Russian Federation on entities of joint conduct of the Russian Federation and Russia's entities, Russia's entities have full state power[3].

Local self-government is carried out in urban, rural settlements and other territories taking into account historical and other local traditions. Local self-government in the Russian Federation is guaranteed by the right to judicial protection, to compensation for additional expenses incurred as a result of decisions taken by state authorities, a ban on restricting the rights of local self-government established by the Constitution of the Russian Federation and federal laws[4].

The key current documents regulating the regional development of the country are the RF Presidential Decree 13, dated January 16, 2017 "On approval of the Fundamentals of the State Policy of Regional Development of the Russian Federation

[2] Constitution of the Russian Federation (adopted by popular vote on December 12, 1993) (subject to amendments made by the Laws of the Russian Federation on Amendments to the Constitution of the Russian Federation 6-FKZ, dated December 30, 2008; 7-FKZ, dated December 30, 2008; 2-FKZ, dated February 05, 2014; 11-FKZ, dated July 01, 2020), paragraph 3, Article 5. Official website of the President of RF. Available at: http://www.kremlin.ru/acts/constitution/item (accessed: July 7, 2022).

[3] Ibidem. Articles 71–73.

[4] Ibidem. Articles 131, 133.

for the period through to 2025"[5] and the Spatial Development Strategy of the Russian Federation approved by the RF Governmental Decree 207-r, dated February 13, 2019 for the period through to 2025[6].

The results of the research developments, presented in scientific monographs and articles, as well as textbooks and study aids, encyclopedic and scientific-practical dictionaries, play an important role in Russia's regional development. The popular scientific library[7] has many Russian-language publications on various aspects of regional socio-economic development and management. A number of scientific monographs are devoted to these issues (Zubarevich, 2010; Minakir, 2017; Vasilyeva et al., 2018; Levchenko et al., 2018; Bazhutova et al., 2019; Chereshnev et al., 2019; Bukhvald et al., 2020; Ilyin et al., 2020; Bobkov et al., 2021; Suslov et al., 2022; Shabunova et al., 2022), textbooks and study aids[8], numerous scientific articles on the regional development issues in respected scientific journals[9]. Together, they provide a good basis for improving the scientific development level of Russian regions.

Dictionaries occupy a special place among publications, devoted to regional economic and social policy. Their important role and place are due to the fact that they reveal the essence of economic and social processes, their attitude to certain provisions of the theory, the history of origin and development, critical attitude to the already existing interpretations of the concepts under consideration, and present systematized literature lists. This genre of studying regional socio-economic systems, as a rule, allows giving a concentrated view of the diversity of socio-

[5] On approval of the Fundamentals of the State Policy of Regional Development of the Russian Federation for the period through to 2025:RF Presidential Decree 13, dated January 16, 2017. Official website of the President of RF. Available at: http://www.kremlin.ru/acts/bank/41641 (accessed: July 7, 2022).

[6] On the approval of the Spatial Development Strategy of the Russian Federation for the period through to 2025: RF Governmental Decree 207-r, dated February 13, 2019. Official website of the Russian Government. Available at: http://government.ru/docs/35733/ (accessed: July 7, 2022).

[7] Scientific Electronic Library of the RSCI. Available at: https://www.elibrary.ru/defaultx.asp? (accessed: July 7, 2022).

[8] Belokrylova O.S., Kiseleva N.N., Khubulova V.V. (2019). *Regional Economics and Management: Textbook*. Moscow: NITs INFRA-M; Burov M.P. (2019). *Regional Economics and Territorial Development Management: textbook for Master's Degree Student*. Moscow: Dashkov i K°.; Ermoshina G.P., Pozdnyakov V.Ya. (2019). *Regional Economy: Textbook*. Moscow: NITs INFRA-M; Kulakova L.I. (2020). *Management of Regional Economic Systems: Textbook*. Orel: Srednerusskii institut upravleniya – filiala RANKhiGS; Manaeva I.V. (2020). *Socio-Economic Inequality of Russia's Regions: Theory and Practice: Textbook*. Belgorod: ID BelGU; Morozova G.G. (2017). *Regional Economy: Textbook for Students Studying in Economic Specialties. 4th Edition*. Moscow: YuNITI-DANA; Nikiforova V.D., Putikhin Yu.E., Nikiforov A.A. (2020). *Regional Economy: Textbook*. Moscow: RIOR; Selishcheva T.A. (2018). *Regional Economy: Textbook*. Moscow: INFRA-M; Urunov A.A. (2020). *Regional Economy: Textbook and Practicum*. Moscow: INFRA-M; Fetisov G.G., Oreshin V.P. (2022). *Regional Economy and Management: Textbook*. Moscow: INFRA-M.

[9] Arctic: Ecology and Economy (Nuclear Safety Institute of RAS, Moscow);

Bulletin of the IE RAS (Institute of Economics of RAS, Moscow);

Voprosy Ekonomiki (Non-profit Partnership "Redaktsiya zhurnala "Voprosy Ekonomiki", Moscow);

Territorial Development Issues (Vologda Research Center of RAS, Vologda);

Journal of the New Economic Association (Journal of the New Economic Association, Moscow);

Population (ISESP FCTAS RAS, Moscow);

Society and Economics (RAS, Moscow);

Problems of Territory's Development (Vologda Research Center of RAS, Vologda);

Spatial Economics (Economic Research Institute, Far-Eastern Branch of RAS, Khabarovsk);

Regionalistics (Economic Research Institute, Far-Eastern Branch of RAS, Khabarovsk);

Region: Economics and Sociology (Institute of Economics and Industrial Engineering within the Siberian Branch of RAS, Novosibirsk);

Russian Economic Journal (EZH MEDIA, CJSC, Moscow);

Social Area (Vologda Research Center of RAS, Vologda);

Living Standards of the population in the Regions of Russia (Federal Center of Theoretical and Applied Sociology of RAS, Moscow);

Ekonomika Severo-Zapada: problemy i perspektivy razvitiya (Institute for Problems of Regional Economics of RAS, Saint Petersburg);

Economy of Region (Institute of Economics of the Ural Branch of RAS, Ural Federal University, Yekaterinburg);

Economic and Social Changes: Facts, Trends, Forecast (Vologda Research Center of RAS, Vologda);

The All-Russian ECO Journal (Siberian Branch of RAS, Institute of Economics and Industrial Engineering within the Siberian Branch of RAS, Novosibirsk State University, Novosibirsk);

Russian Economic Development (Gaidar Institute for Economic Policy, Moscow).

economic relations and practices and to orient users in understanding the essence and direction of their actions. Our study of numerous dictionaries[10] has shown that many of them give general brief characteristics of economic categories that are transferred from dictionary to dictionary, so often the reader is not dealing with author's developments and clarifications of terminology. In addition, often theoretical descriptions are not supported by practical recommendations for their use in socio-economic policy.

We should note that most dictionaries released in recent years are focused on the disclosure of general economic and financial terms and concepts. These dictionaries are of interest to teachers, students of economic universities and faculties rather than to practical workers – economists and managers.

The increasing importance of regional economic policy inevitably leads to the emergence of new assessment and management tools, as a result of which there is a growing need for understanding concepts and terms reflecting socio-economic relations at the regional level. However, there are very few noteworthy dictionaries focused on the regional level of the country's development.

We have studied a large list of dictionaries; the dictionary on regional economics, published in 2011 by the publishing house of the Southern Federal University, attracts attention with its focus on regional issues[11]. It contains representation of more than 750 terms and concepts related to regional topics in alphabetical order. It provides a general and specialized representation of terms which made it a useful source of information for a wide range of readers.

A new notable phenomenon in the study of the regional economy, the standard of living and quality of life was the publication of the dictionary-reference book *Regional Economics* under the general editorship of V.A. Ilyin and A.A. Shabunova. It differs from other representatives of this scientific genre in its focus on revealing the contemporary features of the regional socio-economic system, focusing on the essence of the most important regional characteristics, presenting methodological foundations and the results of the impact of socio-economic generalizations made on the practical development of regional economies and the social sphere, confirmed by the experience of implementing scientific and practical projects at Vologda Research Center of RAS.

The publication includes 5 sections.

The 1st section presents the most general concepts, used in the regional economy. Sections 2–4 are devoted to the economic, social and managerial spheres of the region, respectively. The final 5th section contains the scientific works of economic scientists which are the methodological basis of research on regional topics for the period from 1924 to 2020.

The purpose of our research is to characterize the innovations of this dictionary, to highlight its features and practical significance, as well as to reflect on possible new frontiers of improvement of this publication, which are quite accessible to a highly qualified team of authors, based on the studies of Vologda Research Center of RAS.

The research hypothesis is that the publication of the dictionary-reference book *Regional Economics*, prepared at Vologda Research Center of RAS, brings the genre of theoretical and applied dictionary publications to a new level, which allow combining the theory of regional development and practice

[10] Azriliyan A.N., Kvardakova O.V., Azriliyan O.M. (2015). *Economic Dictionary*. Moscow: Omega L; Arkhipov A.I., Balashov S.A., Bagudina E.G. (2019). *Economic Dictionary*. Moscow: RG-Press; Gorsheneva O.V. (2011). *Dictionary of Terms and Concepts on Regional Economy*. Rostov-on-Don: Yuzhnyi federal'nyi universitet; Pushkareva V.M. (2019). *Economy. Dictionary: Textbook*. Moscow: INFRA-M; Raizberg B.A. (2021). *Modern Socio-Economic Dictionary*. Moscow: INFRA-M; Bobkov V.N. (Ed.). (2014). *Social Policy, Standard and Quality of Life: Dictionary. 2nd Edition*. Moscow: VTsUZh.

[11] Gorsheneva O.V. (2011). *Dictionary of Terms and Concepts on Regional Economy*. Rostov-on-Don: Yuzhnyi federal'nyi universitet.

through published methods that have been tested. This greatly facilitates the work of research teams and governing bodies of Russia's entities which can use sound scientific and methodological tools taking into account the features of the country's spatial development.

Theoretical and methodological tools of the dictionary-reference book

The dictionary-reference book includes 165 terms, as well as classifications introduced into circulation by Russian scientists-regionalists[12] (including the authors of the dictionary). Section 1 "Region as a management object" presents the most common terms used in the regional economics. Section 2 "Economic sphere of the region" contains functional blocks: manufacturing sector (21 terms), small business (8 terms), innovation (12 terms), foreign economic activity (10 terms), and financial system (17 terms). Section 3 "Social sphere of the region" includes the following subsections: demography (23 terms), quality of life (15 terms), labor market (8 terms), and education (11 terms). Section 4 "Management of the region" includes the following blocks: management of socio-economic processes in the region (14 terms) and local self-government (17 terms).

The methodological tools of the publication are reflected in scientific publications of Vologda Research Center of RAS (formerly – the Institute of Socio-Economic Development of Territories of RAS): monographs, articles, scientific reports, preprints and reports (there are 243 sources that Russian and foreign scientists refer to in their research[13]).

Section 5 "Russian scientists whose works are the methodological basis of research on regional topics" presents some publications of 72 Russian scientists[14].

Data and methods

In the dictionary-reference book *Regional Economics*, tabular and graphical data of calculated indicators (102 tables, graphs and figures) are usually preceded by schemes of interrelations within individual concepts characterizing regional development, as well as indicators characterizing the socio-economic dynamics of the Russian Federation and the subjects of the Northwestern Federal District (60 schemes). They explain the concepts presented, consider them in the system of internal and external factors of the region's development[15].

The author's methods, in which the theoretical and methodological definitions presented by the terms and classifications of the dictionary, as well as algorithms and formulas for their practical application have been applied, are supported by publications of monographs, educational and methodological manuals, articles in authoritative journals, as well as research reports carried out at VolRC RAS. Methodological tools, algorithms of step-by-step actions, as well as the evaluation of the research results by VolRC RAS are reflected in 43 methods. All this gives a comprehensive view in the chain: the concept – relationships – level and dynamics – methodological grounds for the application of concepts and the results of practical application.

Thus, the dictionary-reference book *Regional Economics* provides a comprehensive theoretical understanding of the conceptual apparatus, methodological and methodic tools of its application, involved in regional studies, supported by the approbation results.

In the most advanced editions of the dictionary genre, as a rule, the following types of possible author's articles are presented in detail: 1) term (concept); 2) model (law, method), 3) economic school / theory. The type of article "methodology"

[12] Ilyin V.A., Shabunova A.A. (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M. Pp. 29; 38–39; 121–123; 127–128; 129–130; 132–133; 240–253.

[13] Ibidem. Pp. 43–51; 152–157; 264–267.

[14] Ibidem. Pp. 327–349.

[15] Ibidem. Pp. 6–8; 10–17; 19; 21–22; 24–28; 30–31; 33–35; 41; 124; 128–129; 130–146; 149–150; 257; 260.

is definitely an innovation of the author's collective of the Vologda dictionary-reference book and its cardinal difference from all similar publications known to us. Section 2 "Economic sphere of the region" presents 18 methods. With their help, three main issues are solved from different sides: a) *the effectiveness of budget regulation in the region* (method for assessing the impact of budget threats on the stability of the revenue base of the consolidated budgets of Russia's entities[16]; method for assessing the effectiveness of inter-budget regulation in the region[17] (Pechenskaya, 2015); method for assessing the level of budget potential of municipalities[18] (Pechenskaya, 2019); method for assessing the region's budget security level[19] (Pechenskaya, Povarova, 2010); method for assessing the region's tax potential level[20] (Uskova et al., 2019)); b) *production, scientific, technological and human resource potential of the region* (method for assessing the scientific and technological potential of territories[21] (Gulin et al., 2018a); method for assessing the human resource potential of small businesses[22] (Terebova et al., 2011); method for assessing the food security of the region[23]; method for assessing the expert specialization of small and medium-sized businesses[24] (Yakushev, 2019); method for assessing the effectiveness of state support for small businesses at the regional level[25] (Kremin, 2017); method for comparative assessment of the development level of the regions' industrial complex, based on the calculation of an integral indicator[26] (Mazilov, 2015); method for the formation of production clusters in the region[27] (Uskova et al., 2010); methodological tools for assessing the vertical integration level of economic entities[28] (Kozhevnikov, 2016); methodological approach to the classification and evaluation of non-primary exports[29] (Gulin et al., 2018b)); *c) tourism and development of the region* (method for assessing the tourism impact on the regional development[30] (Lukin et al., 2018); method for assessing the region's tourist infrastructure development[31] (Uskova, Velichkina, 2014); method for assessing the tourist potential of the territory[32] (Pechenskaya, Povarova, 2010; Uskova et al., 2010; Terebova et al., 2011; Kremin, 2017; Mazilov, 2015; Kozhevnikov, 2016; Gulin et al., 2018a; Gulin et al., 2018b; Lukin et al., 2018; Uskova, Velichkina, 2014; Uskova et al., 2019 Yakushev, 2019)).

Section 3 "Social sphere of the region" presents 14 methods[33]. They can be divided into three blocks: 1) *demography*, 2) *human resource potential* (especially in terms of labor potential) and 3) *quality of life*. The demographic block includes two methods (method for modeling self-preservation and reproductive behavior using the decision tree method[34] (Korolenko, 2018a; Korolenko, 2018b; Kalachikova, Korolenko, 2018); method for determining the stages of the demographic dividend[35] (Barsukov, 2019)). The unit of estimation of human resource potential includes 5 methods (method of integrated assessment of the region's labor potential[36]

[16] Ilyin V.A., Shabunova A.A. (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M. Pp. 51–53; Galukhin A.V. (2017). Managing the sustainability of the revenue base of the consolidated budgets of Russia's entities (case study of the subjects of the Northwestern Federal District): *Candidate of Sciences (Economics), Abstract of Thesis*. Saint Petersburg State University.

[17] Ilyin V.A., Shabunova A.A. (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M. Pp. 78–80.

[18] Ibidem. Pp. 88–92.

[19] Ibidem. Pp. 92–95.

[20] Ibidem. Pp. 95–98.

[21] Ibidem. Pp. 63–67.

[22] Ibidem. Pp. 56–62.

[23] Ibidem. Pp. 68–72.

[24] Ibidem. Pp. 99–100.

[25] Ibidem. Pp. 101–105.

[26] Ibidem. Pp. 105–110.

[27] Ibidem. Pp. 110–113.

[28] Ibidem. Pp. 113–118.

[29] Ibidem. Pp. 118–119.

[30] Ibidem. Pp. 54–57.

[31] Ibidem. Pp. 72–77.

[32] Ibidem. Pp. 83–88.

[33] Ibidem. Pp. 158–239.

[34] Ibidem. Pp. 186–195.

[35] Ibidem. Pp. 196– 199.

[36] Ibidem. Pp. 175–179.

(Popov, 2019); method of complex evaluation of the tripartite labor unrealized potential of the region[37] (Leonidova etc., 2018; Chekmareva, Rossoshanskaya, 2017); method for assessing labor potential quality of the region's population[38] (Leonidova etc., 2018); method for assessing under-utilization of labor potential quality in the region[39] (Leonidova, Chekmareva, 2009; Chekmareva, 2011); method for assessing the development of human resource potential of children[40] (Korolenko, Gordievskaya, 2018)). The block of quality of life is represented by 7 methods (method for measuring the family of centile coefficients of income inequality of the macrostrate population[41] (Lapin et al., 2020a; Lapin et al., 2020b); method for measuring social health[42] (Shabunova, Morev, 2015); method for index assessment of the quality of life of Russia's regions[43] (Rossoshanskii, 2016); method for assessing the subjective perception of the quality of life[44] (Rossoshanskii, 2019); method for assessing the subjective quality of working life[45] (Leonidova et al., 2018; Belekhova, 2019); method for calculating the "price of disability"[46] (Shabunova et al., 2014); calculation of the integral index of the education development level in the region[47] (Leonidova et al., 2014)).

Section 4 "Region management" presents 11 methods. They can be divided into three blocks: 1) *management of regional socio-economic systems*, 2) *management of municipal socio-economic systems*; 3) *management of inter- and intraregional socio-economic communications*. Block 1 contains 4 methods (method for comprehensive assessment of the competitiveness of the regional socio-economic system[48] (Uskova et al., 2010); method for assessing the socio-economic development level of regions[49] (Voroshilov, 2019; Gubanova, Voroshilov, 2019); method for assessing the sustainability of the regional socio-economic system[50] (Uskova, 2009); method for calculating the index of environmental sustainability of regional development[51] (Selimenkov, Kuznetsov, 2014)). The block related to the management of municipal socio-economic systems is represented by five methods (method for assessing the state of housing and communal services in municipalities[52] (Kozhevnikov, 2013); method for assessing the socio-economic potential of municipalities[53]; method for assessing the socio-economic development level of municipalities[54]; method for assessing the effectiveness of regional policy for the municipalities' development[55] (Uskova, Voroshilov, 2015; Voroshilov, 2019); method for calculating the gross urban product[56] (Uskova et al., 2011; Chekavinskii, Gutnikova, 2012)). The block for inter- and intraregional socio-economic communications includes two methods (method for assessing the effectiveness of the management of the agro-industrial complex at different levels of the hierarchy[57] (Uskova et al., 2013) and methodological tools for activating interregional interaction as a factor in the economic development of an industrial region[58] (Uskova et al., 2016)).

[37] Ilyin V.A., Shabunova A.A. (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M. Pp. 183–186.
[38] Ibidem. Pp. 199–204.
[39] Ibidem. Pp. 204–208.
[40] Ibidem. Pp. 219–228.
[41] Ibidem. Pp. 158–163.
[42] Ibidem. Pp. 163–169.
[43] Ibidem. Pp. 169–175.
[44] Ibidem. Pp. 208–211.
[45] Ibidem. Pp. 211–216.
[46] Ibidem. Pp. 228–231.
[47] Ibidem. Pp. 231–239.
[48] Ibidem. Pp. 267–275.
[49] Ibidem. Pp. 291–295.
[50] Ibidem. Pp. 295–302.
[51] Ibidem. Pp. 317–322.
[52] Ibidem. Pp. 275–279.
[53] Ibidem Pp. 279–287; Uskova T.V., Voroshilov N.V. (2017). *Regional Politics to Develop Municipal Formations: Textbook*. Vologda: VolRC RAS.
[54] Ilyin V.A., Shabunova A.A. (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M. Pp. 287–291.
[55] Ibidem. Pp. 302–303.
[56] Ibidem. Pp. 313–317.
[57] Ibidem. Pp. 306–313.
[58] Ibidem. Pp. 322–326.

Discussion of the results presented in the dictionary-reference book

About the structure of terms (concepts)

The content of terms in the dictionary-reference book is revealed unevenly. Here, the team, perhaps, has the greatest need to further improve the quality of the presented material. In classical dictionary editions, **the following so-called basic requirements are imposed on the term (concept):** 1) the so-called "*headword*" in Russian and English (full and abbreviated name); etymology – the origin of the word (if it is applicable); 2) *definition* – scope; 3) *history* – author(s), references, time, place, first publication (title in the original language and translation); 4) *application* – indicators (if it is applicable): absolute, relative; subjects (if it is applicable); legal regulation (if it is applicable); application examples (references): positive, negative; 5) *attitude to economic theory* (references) – proponents, separators, opponents; 6) *criticism*; 7) *literature*: scientific publications over the past 10 years in Russian and foreign languages, the most cited; publications of subjects of application. It goes without saying that articles about terms (concepts) should be copyrighted.

Of course, in this case, the dictionary-reference book is not classical, but applied, and terminology is not its main achievement. Nevertheless, the high potential of its developers allows additionally taking into account a number of the above basic requirements for the disclosure of concepts and comply with them in further editions of the dictionary-reference book. This will help to reveal the terms more fully, and the fixed authorship will increase the responsibility of specific performers.

About the structure of methods

Currently, there are no uniform state requirements for methodological recommendations (methods). Our analysis of the structure of the methods, which are presented in the dictionary-reference book *Regional Economics*, has proved that the development stages of the methods could be grouped into the following logical blocks (sections): 1) definition of indicators, criteria, formation of tables, qualitative and mathematical models; 2) data collection and preparation of the research information base; 3) calculation of indicators; 4) analysis, assessment and interpretation of results; 4) approbation of the results.

We think such a structure of disclosure of methods is quite acceptable. However, not all logical blocks are equally represented in relation to the methods described in the dictionary-reference book (*Table*).

Development stages of methods and their implementation in the dictionary-reference book

no. p. p.	Stage*	Mentions of the stage in the methods			
		Total, number of methods	Including the areas of analysis, the number of methods		
			Economic sphere of the region	Social sphere of the region	Region management
1	Definition of indicators, criteria, formation of tables, qualitative and mathematical models	26	12	3	11
2	Data collection and preparation of the research information base	22	8	11	3
3	Calculation	31	13	8	10
4	Analysis, evaluation and interpretation of results**	25	4	10	11
5	Evaluation of results	43	18	14	11

* The authors of the article carried out logical grouping of the stages of the methods.
** Partially it is taken out of the stage "Evaluation results".
According to: Ilyin V.A, Shabunova A.A (Eds.). (2021). *Regional Economics: Dictionary-Reference Book*. Moscow: INFRA-M.

All the methods have a stage of "Evaluation of results" (100%), which reflects their practical implementation and deserves high praise. The stage "Calculation" is indicated in 72.1% of the methods (including in the economic sphere of the region – in 72.2%; in the social sphere of the region – 57.1%; in the management of the region – in 90.9%). The stage "Determination of indicators, criteria, formation of tables, qualitative and mathematical models" is indicated in 60.5% of methods (including in the economic sphere of the region – in 66.7%; in the social sphere of the region – in 21.4%; in regional management – 100%). The stage "Analysis, evaluation and interpretation of results" is present in the description of 58.1% of the methods (including the economic sphere of the region – in 22.2%; the social sphere of the region – 71.4%; regional management – 100%). Less often than others, the stage "Data collection and preparation of the research information base" is indicated – 51.2% of methods (including in the economic sphere of the region – in 44.4%; in the social sphere of the region – 78.6%; in regional management – 27.3%).

Therefore, the stages of creating methods are not unified. Most likely, this is due to the various time stages of their development. In addition, the implementation stages of the methods designed to analyze different areas of the region vary significantly. For example, the stages "Calculation" and "Determination of indicators, criteria, formation of tables, qualitative and mathematical models" are least indicated in the methods for studying the social sphere of the region (respectively, in 57.1 and 21.4% of the methods), the stage "Analysis, evaluation and interpretation of results" is least represented in the methods of analysis of the spheres of the region (in 22.2% of the methods), and the stage "Data collection and preparation of the research information base" is least indicated in the methods of regional management analysis (27.3%). In the future, when updating already developed and creating new methods, it is advisable, in our opinion, for the authors of the dictionary-reference book to be guided by unified stages so that all of them are indicated in the methods. This will certainly improve their quality.

Reflection in the methods of studying the standard of living and quality of life as the ultimate goals of economic and social development of the region

The dictionary-reference book *Regional Economics* widely presents the study of the issues of the region's quality of life and standard of living. The basis for this conclusion is the *table developed by us "Studying the components of the standard of living and quality of life in the methods of the dictionary-reference book Reginal Economics (Appendix)*, which is based on a comparison of the content of the methods of the dictionary-reference book *Reginal Economics* with the components of the standard of living and quality of life, developed and confirmed by the publications of the All-Russian Center for Living Standards and Institute of Socio-Economic Studies of Population of RAS (Bobkov et al., 2007; Bobkov, 2017; Bobkov, Gulyugina, 2021; Bobkov et al., 2022). The table proves that all the main components of the standard of living and quality of life were taken into account when developing methods, namely, they were studied: 1) the quality of society; 2) the quality of working life; 3) the quality of social infrastructure; 4) the life safety; 5) the environmental quality; 6) the standard of living (consumption); 7) people's satisfaction with the standard of living and quality of their lives. However, not all of them are fully disclosed in special methods.

The *Appendix* analyzes 34 methods including the study of various aspects of the standard of living and quality of life. The methods are conventionally arranged into two groups: revealing the study of certain aspects of the economic impact on the standard of living and quality of life (24 methods) and showing the characteristics of the economic, social and managerial potential of the region (10 methods).

It is important that the authors of the dictionary-reference book do not focus only on the development of tools for assessing certain aspects of the economic impact on the standard of living and quality of life. They study the potential of the economic, social and managerial spheres of the region quite extensively (these methods are highlighted in italics in the *Appendix*) which makes it possible to identify a "gap" between the actual state of affairs and potential opportunities for its improvement. In VolRC RAS, the culture of sociological research is well developed which allows sociological methods to study various aspects of the region's development potential. All methods, aimed at identifying the potential of economic, social and managerial aspects of the region's development, in our opinion, are relevant and have high practical significance. Among them, we should highlight method 20 "Assessment of the formation of the human resource potential of children" for its novelty and thoroughness of approaches to identifying the potential of the younger generation that determines the future of the country.

If we are guided by the components' structure of the standard of living and quality of life used by the authors of the article, the research of the "*quality of society*" is most fully analyzed in the methods of studying the social sphere of the region (methods 11–18). They comprehensively consider the aspects of "health" and "education" (method 13 "Social health" and method 15 "Calculation of the integral index of education development in the region"). The remaining indicators of the "quality of society" component are dispersed according to different methods.

The component "*quality of working life*" is not represented by separate methods that characterize its integral aspects, such as, for example, "quality of employment" or "quality of jobs", etc. The study of individual indicators characterizing the quality of working life is dispersed in various methods of studying the economic sphere (methods 1–3), the social sphere (methods 7–9 and 14) and the sphere of regional management (methods 25–28 and 31). These issues have been extensively and thoroughly studied in the methods of identifying labor potential (methods 21–24). However, we should remember that the category "potential" characterizes only the prerequisites for the standard of living and quality of life – "opportunities". When the actual standard of living and quality of life or their individual components are studied, the "conditions" for the realization/non-realization of the existing potential are also identified and the problem is considered in the paradigms of opportunity – realization terms.

The component "quality of social infrastructure" is studied in parts in the methods of studying the economic sphere (method 4), the social sphere (methods 15 and 17) and the sphere of regional management (methods 25, 28–29; 31 and 33).

The components "environmental quality" and "life satisfaction (subjective component)" are well represented by complex methods 32 "Calculation of the index of environmental sustainability of the region's development", 17 "Assessment of subjective perception of quality of life" and 18 "Assessment of subjective quality of working life". In addition, a number of indicators of these components of quality of life are present in other methods.

The component "standard of living" is studied in complex methods 3 "Assessment of food security of the region" and 16 "Centile coefficients of income inequality". A number of indicators of this component are partly presented in other methods.

Perhaps less than others, the methods of the dictionary-reference book reflect issues related to the disclosure of such a component of the standard of living and quality of life as "*life safety*". They are partially indicated only in 4 methods devoted to the disclosure of other problems.

Method 19 "Index assessment of the quality of life", presented in the dictionary-reference, deserves high praise. It contains indicators characterizing the quality of society, quality of working life, life

safety and the standard of living in the region. If it is subsequently supplemented with indicators characterizing the development of social infrastructure and subjective assessments of people's satisfaction with life, then such a method would allow a comprehensive assessment of the standard of living and quality of life in the region.

Once again, we should emphasize the high novelty and practical significance of the analytical materials and methods, presented in the dictionary-reference book *Regional Economics*. At the same time, it is worth noting that its developers have a great potential for their development and inclusion in the research field of new, not yet fully studied areas in which the standard of living and quality of life of the region are formed.

Conclusion

The issues of increasing the scientific support rate for the economic and social development of regions, the effectiveness of legislative and executive authorities and local self-government at a new development stage of the Russian Federation are becoming increasingly important. There is still a lot to be done to achieve full economic sovereignty of the country, to improve the standard of living and quality of life of Russian citizens.

The release of the dictionary-reference book *Regional Economics* is a notable event in scientific and practical life which makes it possible to equip regional scientific communities and authorities with scientific and methodological tools for solving practical socio-economic issues, tested during evaluation in regional and municipal formations of the Vologda Oblast, as well as partially applied to assess the situation in other Russian regions. The wide implementation of the methods in the Vologda Oblast and their creative adaptation in other regions of the country will undoubtedly make it possible to more productively solve the urgent tasks of Russia's economic and social development and increase the scientific validity of public and municipal administration.

In the article, we have confirmed the proposed hypothesis. The publication of the dictionary-reference book *Regional Economics,* prepared at VolRC RAS, takes the genre of dictionary and practical research to a new level allowing combining the theory of regional development and practice through published methods that have been evaluated. This greatly facilitates the work of research teams and governing bodies of Russia's entities.

The team of authors of the dictionary-reference book *Regional Economics*, representing the fruitfully developing Vologda Research Center of RAS, taking into account practical feedback from colleagues from other regions about this scientific and practical manual, as well as recommendations from representatives of the scientific community and all interested parties, undoubtedly in the future realizes the possibility of issuing its second, even more perfect edition.

References

Barsukov V.N. (2019). From the demographic dividend to population aging: World trends in the system-wide transition. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 12(4), 167–182. DOI: 10/15838/esc.2019.4.64.11 (in Russian).

Bazhutova E.A. et al. (2019). *Sotsial'no-ekonomicheskoe razvitie Severo-Arkticheskikh territorii Rossii: monografiya* [Socio-Economic Development of the North-Arctic Territories of Russia: Monograph]. Apatity: Institut ekonomicheskikh problem im. G.P. Luzina FITs KNTs RAN.

Belekhova G.V. (2019). Subjective approach to assessment quality of working life of working-age population of the region. *Nauchnye issledovaniya i razrabotki. Ekonomika=Scientific Research and Development. Economics*, 7, 6(42), 9–19. DOI: 10.12737/2587-9111-2019-9-19 (in Russian).

Bobkov V.N. (2017). The level and quality of life in Russian society (2014–2016). *Rossiiskii ekonomicheskii zhurnal=Russian Economic Journal*, 6, 79–94 (in Russian).

Bobkov V.N., Bobkova T.E. et al. (2022). *Uroven' i kachestvo zhizni naseleniya Rossii: ot real'nosti k proektirovaniyu budushchego: monografiya* [Standard of Living and Quality of Life of the Russian Population: From Reality to Designing the Future: Monograph]. Moscow: FNISTs RAN.

Bobkov V.N., Gulyugina A.A. et al. (2021). *Monitoring dokhodov i urovnya zhizni naseleniya Rossii – 2020 god: monografiya* [Monitoring of Incomes and Living Standards of Russia – 2020: Monograph]. Moscow: Fabrika Ofsetnoi Pechati.

Bobkov V.N., Gulyugina A.A., Odintsova E.V. et al. (2007). *Kachestvo i uroven' zhizni naseleniya v novoi Rossii (1991–2005 gg.): monografiya* [The Quality and Standard of Living in the New Russia (1991–2005): Monograph]. Moscow: VTsUZh.

Bukhval'd E.M., Vilenskii A.V. et al. (2020). *Novaya prostranstvennaya strategiya dlya Rossii: monografiya* [A New Spatial Strategy for Russia: Monograph]. Moscow: Institut ekonomiki RAN.

Chekavinskii A.N., Gutnikova E.A. (2012). Assessment of the gross product of the city and the direction of its increase. *Problemy razvitiya territorii=Problems of Territory's Development,* 2(58), 36–44 (in Russian).

Chekmareva E.A. (2011). Increasing the level of realization of labor potential: The role of wages. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 2(14), 165–172 (in Russian).

Chekmareva E.A., Rossoshanskii A.I. (2017). Complex assessment of unimplemented labor potential of the Russian regions. *Gosudarstvennoe upravlenie: elektronnyi vestnik=Public Administration. E-Journal*, 63, 280–296. Available at: https://cyberleninka.ru/article/n/kompleksnaya-otsenka-nerealizovannogo-trudovogo-potentsiala-regionov-rossii/viewer (in Russian).

Chereshnev V.A., Chichkanov V.P., Kuklin A.A. (2019). *Diagnostika i reagirovanie na ugrozy sotsial'no-ekonomicheskomu razvitiyu regionov: monografiya* [Diagnostics and Response to Threats to the Socio-Economic Development of Regions: Monograph]. Yekaterinburg: Institut ekonomiki Ural'skogo otdeleniya RAN.

Gubanova E., Voroshilov N. (2019). Assessment and mechanism of regulating inter-regional socio-economic differentiation (case study of the Russian Federation). *Regional Science Inquiry,* 11(3), 55–68.

Gulin K.A., Mazilov E.A., Alfer'ev D.A., Kvitko K.B. (2018a). *Problemy formirovaniya nauchno-tekhnologicheskogo prostranstva* [Problems of Formation of Scientific and Technological Space]. Vologda: VolRC RAS.

Gulin K.A., Yakushev N.O., Mazilov E.A. (2018b). Promoting economic growth in regions of the Russian Federation by boosting the development of non-resource-based exports. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 11(3), 57–70. DOI: 10.15838/esc.2018.3.57.4 (in Russian).

Ilyin V.A. et al. (2020). *Tendentsii i problemy razvitiya territorii: nauchnye trudy* 2016–2020 gg. V 6 t. [Trends and Problems of Territorial Development: Scientific Papers 2016–2020. In 6 Volumes]. Vologda: VolRC RAS.

Kalachikova O.N., Korolenko A.V. (2018). Patterns of reproductive behavior of population (on the materials of Vologda Oblast). *Narodonaselenie=Population*, 21(4), 109–121. DOI: 10.26653/ 1561-7785-2018-21-4-10 (in Russian).

Korolenko A.V. (2018a). Models of reproductive and matrimonial behavior of the Vologda Oblast population. In: *Molodye uchenye – ekonomike regiona: sb. mat-lov XVII nauchn.-prakt. konf. (15 dekabrya 2017g.)* [Young Scientists – Regional Economy: Collection of Materials of the 17th Scientific and Practical Conference (December 15, 2017)]. Vologda: VolRC RAS (in Russian).

Korolenko A.V. (2018b). Patterns of population's self-preservation behavior: Research approaches and building experience. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 11(3), 248–263. DOI: 10.15838/esc.2018.3.57.16 (in Russian).

Korolenko A.V., Gordievskaya A.N. (2018). Human potential of the child population: Understanding and assessment. *Sotsial'noe prostranstvo=Social Area,* 5(17). DOI: 10.15838/sa.2018.5.17.3 (in Russian).

Kozhevnikov S.A. (2013). Comprehensive assessment of the state of housing and communal services in the municipalities of the region. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 6(30), 225–234 (in Russian).

Kozhevnikov S.A. (2016). Management of vertically integrated systems formation and development in the Russian economy. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 6(48), 53–69. DOI: 10.15838/esc.2016.6.48.3 (in Russian).

Kremin A.E. (2017). Assessment methodology of state support efficiency of small entrepreneurship in the region. *Problemy razvitiya territorii=Problems of Territory's Development,* 3(89), 46–61 (in Russian).

Lapin N.I., Ilyin V.A., Morev M.V. (2020a). Extremal inequalities and the social state (part 1). *Sotsiologicheskie issledovaniya=Sociological Studies*, 1, 4–17. DOI: 10.31857/S013216250008378-8 (in Russian).

Lapin N.I., Ilyin V.A., Morev M.V. (2020a). Extremal inequalities and the social state (part 2). *Sotsiologicheskie issledovaniya=Sociological Studies,* 2, 20–30. DOI: 10.31857/S013216250008491-3 (in Russian).

Leonidova G.V, Chekmareva E.A. (2009). Experience in assessing the quality of labor potential at the regional level. *Chelovek i trud*, 12, 30–33 (in Russian).

Leonidova G.V., Golovchin M.A., Solov'eva T.S. (2014). *Sfera obrazovaniya territorii: sostoyanie i perspektivy razvitiya* [The Education Sphere of Territories: The State and Development Prospects]. Vologda: ISERT RAN.

Leonidova G.V., Rossoshanskaya E.A., Popov A.V. (2018). *Monitoring kachestva trudovogo potentsiala: 20 let regional'nykh issledovanii: monografiya* [Monitoring the Labor Potential Quality: 20 Years of Regional Research: Monograph]. Vologda: VolRC RAS.

Levchenko S.G., Balashov E.B., Burak P.I. et al. (2018). *"Gosudarstvo razvitiya": effektivnaya ekonomicheskaya model' razvitiya strany i regionov. Opyt realizatsii v Irkutskoi oblasti: monografiya* ["The State of Development": An Effective Economic Model for the Development of the Country and Regions. Implementation Experience in the Irkutsk Oblast: Monograph]. Moscow: Ekonomika.

Lukin E.V., Leonidova E.G., Sidorov M.A. (2018). Boosting domestic demand as a driving force of economic growth (on the example of domestic tourism sphere). *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 11(4), 125–143. DOI: 10.15838/esc.2018.4.58.8 (in Russian).

Mazilov E.A. (2015). *Razvitie promyshlennogo kompleksa v kontekste modernizatsii ekonomiki regiona: monografiya* [Development of the Industrial Complex in the Context of Modernization of the Regional Economy: Monograph]. Vologda: ISERT RAN.

Minakir P.A. (2017). *Issledovaniya ekonomiki Dal'nego Vostoka. 1975–2000* [Studies of the Economy of the Far East: 1975–2000]. Khabarovsk: Institut ekonomicheskikh issledovanii Dal'nevostochnogo otdeleniya RAN.

Pechenskaya M.A. (2015). *Mezhbyudzhetnye otnosheniya: sostoyanie, regulirovanie, otsenka rezul'tativnosti: monografiya* [Inter-Budgetary Relations: State, Regulation, Performance Evaluation: Monograph]. Vologda: ISERT RAN.

Pechenskaya M.A. (2019). Budget potential of municipal entities: Assessment and directions for development (on the example of Vologda Oblast). *Studies on Russian Economic Development,* 30(4), 453–461.

Pechenskaya M.A., Povarova A.I. (2010). Theoretical and methodological aspects of the budget security of the region. *Problemy razvitiya territorii=Problems of Territory's Development,* 5(51), 41–48 (in Russian).

Popov A.V. (2019). *Trudovoi potentsial Rossii: otsenka i instrumenty povysheniya urovnya realizatsii: monografiya* [Russia's Labor Potential: Assessment and Tools to Increase the Level of Implementation: Monograph]. Vologda: VolRC RAS.

Rossoshanskii A.I. (2016). Methodology for the index assessment of the quality of life in Russian regions. *Problemy razvitiya territorii=Problems of Territory's Development,* 4(84), 124–137 (in Russian).

Rossoshanskii A.I. (2019). Methodological aspects of assessing the subjective perception of the quality of life of the region's population. *Voprosy territorial'nogo razvitiya=Territorial Development Issues,* 5(50). Available at: http://vtr.isert-ran.ru/article/28381. DOI: 10.15838/tdi.2019.5.50.7 (in Russian).

Selimenkov R.Yu., Kuznetsov A.P. (2014). Environmentally sustainable development issues. *Problemy razvitiya territorii=Problems of Territory's Development,* 3(71), 105–115 (in Russian).

Shabunova A.A. et al. (2014). *Problemy sotsial'noi konsolidatsii: invalidy v regional'nom soobshchestve: monografiya* [Problems of Social Consolidation: Disabled People in the Regional Community: Monograph]. Vologda: ISERT RAN.

Shabunova A.A. et al. (2022). *Sotsial'noe razvitie territorii: aktual'nye trendy i novye vyzovy: monografiya* [Social Development of Territories: Current Trends and New Challenges: Monograph]. Vologda: VolRC RAS.

Shabunova A.A., Morev M.V. (2015). Creating a methodological approach to the study of social health as an indicator of social development. *Sotsiologicheskii al'manakh*, 6, 473–489 (in Russian).

Suslov V.I., Ershov Yu.S., Gulakova O.I. et al. (2022). *Modeli, analiz i prognozirovanie prostranstvennoi ekonomiki: monografiya* [Models, Analysis and Forecasting of Spatial Economy: Monograph]. Novosibirsk: Izd-vo Instituta ekonomiki i organizatsii promyshlennogo proizvodstva Sibirskogo otdeleniya RAN.

Terebova S.V., Podolyakin O.V., Uskov V.S., Egorina S.Yu. (2011). *Predprinimatel'stvo v regione: sostoyanie, perspektivy: monografiya* [Entrepreneurship in the Region: State, Prospects: Monograph]. Vologda: ISERT RAN.

Uskova T.V. (2009). *Upravlenie ustoichivym razvitiem regiona: monografiya* [Management of the Regional Sustainable Development: Monograph]. Vologda: ISERT RAN.

Uskova T.V., Barabanov A.S., Popova O.I. et al. (2010). *Proizvodstvennye klastery i konkurentosposobnost' regiona: monografiya* [Production Clusters and Competitiveness of the Region: Monograph]. Vologda: In-t sotsial'no-ekonomicheskogo razvitiya territorii RAN.

Uskova T.V., Chekavinskii A.N., Gutnikova E.A., Voroshilov N.V., Kozhevnikov S.A. (2011). *Razrabotka metodiki rascheta valovogo gorodskogo produkta munitsipal'nogo obrazovaniya "Gorod Vologda": otchet o NIR* [Development of a Methodology for Calculating the Gross Urban Product of the Vologda City Municipality: Research Report]. Vologda: ISERT RAN.

Uskova T.V., Lukin E.V. (2016). About the prospects for development of the region on the basis of interregional cooperation. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 3(45), 60–81. DOI: 15838/esc. 2016.3.45.3 (in Russian).

Uskova T.V., Pechenskaya M.A., Vasil'eva T.S. (2019). *Vliyanie byudzhetno-nalogovoi sistemy na obshchestvennuyu effektivnost' gosudarstvennogo upravleniya v Rossiiskoi Federatsii: otchet o NIR* [The Impact of the Budget and Tax System on the Public Efficiency of Public Administration in the Russian Federation: Research Report]. Vologda.

Uskova T.V., Selimenkov R.Yu., Chekavinskii A.N. (2013). *Agropromyshlennyi kompleks regiona: sostoyanie, tendentsii, perspektivy* [Agro-Industrial Complex of the Region: State, Trends, Prospects]. Vologda: ISERT RAN.

Uskova T.V., Velichkina A.V. (2014). *Turistskaya infrastruktura v regione: otsenka i perspektivy: preprint* [Regional Tourism Infrastructure: Assessment and Prospects: Preprint]. Vologda: ISERT RAN.

Uskova T.V., Voroshilov N.V. (2015). *Regional'naya politika territorial'nogo razvitiya: monografiya* [Regional Policy of Territorial Development: Monograph]. Vologda: ISERT RAN.

Vasil'eva A.V., Volkov A.D., Karginova-Gulinova V.V. et al. (2018). *Vosproizvodstvo trudovogo potentsiala severnogo regiona v usloviyakh stareniya naseleniya (na primere Respubliki Kareliya)* [Reproduction of the Labor Potential of the Northern Region in the Conditions of Population Aging (Case Study of the Republic of Karelia)]. Petrozavodsk: KarNTs RAN.

Voroshilov N.V. (2019). Regional policy on the development of municipalities: Efficiency assessment and implementation specifics in the current context. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 12(5), 58–75. DOI: 10.15838/esc.2019/5.65.4 (in Russian).

Yakushev N.O. (2019). Assessment of export specialization of small and medium enterprises in Russia. *Nauchnye issledovaniya i razrabotki. Ekonomika=Scientific Research and Development. Economics*, 6, 23–34. DOI: 10.12737/2587-9111-2019-23-34 (in Russian).

Zubarevich N.V. (2010). *Regiony Rossii: neravenstvo, krizis, modernizatsiya* [Regions of Russia: Inequality, Crisis, Modernization]. Moscow: Nezavisimyi institut sotsial'noi politiki.

APPENDIX

Studying the components of the standard of living and quality of life
in the methods of the dictionary-reference book Regional Economics

In methods of the dictionary-reference book	Components of the standards of living and quality of life in the authors' classifications of the article (Bobkov et al., 2022)						
	Quality of society	Quality of working life	Quality of social infrastructure	Life safety	Environ-mental quality	Standard of living (consumption)	Life satisfaction (subjective component)
Methods of studying the economic sphere of the region							
1. Comparative assessment of the development level of the regions' industrial complex based on the calculation of the integral indicator		X					
2. Assessment of the effectiveness of state support for small businesses at the regional level	X	X					
3. Assessment of food security of the region		X				X	
4. Assessment of the tourist infrastructure development of the region			X	X	X		
5. Assessment of the effectiveness of managing the sustainability of the revenue base consolidated budgets of Russia's entities						X	
6. Assessment of the region's budget security level						X	
7. Assessment of the human resource potential of small businesses	X	X					
8. Assessment of the tourist potential of the territory		X	X		X		
9. Assessment of the region's tax potential level		X					
10. Assessment of the level of budget potential of municipalities						X	

In methods of the dictionary-reference book	Components of the standards of living and quality of life in the authors' classifications of the article (Bobkov et al., 2022)						
	Quality of society	Quality of working life	Quality of social infrastructure	Life safety	Environ-mental quality	Standard of living (consumption)	Life satisfaction (subjective component)
Methods of studying the social sphere of the region							
11. Determination of the implementation stages of the demographic dividend	X						X
12. Self-preservation and reproductive behavior	X						X
13 . Social health	X						
14. Calculation of the "price of disability"	X	X				X	
15. Calculation of the integral index of education development in the region	X		X			X	
16. Centile coefficients of income inequality						X	
17. Assessment of subjective perception of quality of life	X	X	X	X	X	X	X
18. Assessment of the subjective quality of working life		X					X
19. Index assessment of the quality of life	X	X		X		X	
20. Assessment of the formation of the human resource potential of children	X						X
21. Comprehensive assessment of the region's labor potential	X					X	
22. Assessment of the quality of the labor potential of the region	X						X
23. Comprehensive tripartite assessment of the unrealized labor potential of the region	X	X					
24. Assessment of underutilization of the quality of labor potential	X	X					X

In methods of the dictionary-reference book	Components of the standards of living and quality of life in the authors' classifications of the article (Bobkov et al., 2022)						
	Quality of society	Quality of working life	Quality of social infrastructure	Life safety	Environ-mental quality	Standard of living (consumption)	Life satisfaction (subjective component)
Methods of studying regional management							
25. Assessment of the level of socio-economic development of the regions	X	X	X			X	
26. Assessment of the effectiveness of the management of the agro-industrial complex at different levels of the hierarchy		X				X	X
27. Calculation of gross urban product		X					
28. Assessment of the level of socio-economic development of municipalities	X	X	X			X	
29. Assessment of the state of housing and communal services in municipalities			X		X	X	
30. Evaluation of the effectiveness of regional policy for the municipalities' development	X						X
31. Assessment of the stability of the regional socio-economic system	X	X	X	X	X	X	
32. Calculation of the index of environmental sustainability of the region's development					X		
33. Tools for enhancing interregional cooperation as a factor in the economic development of an industrial region	X		X				
34. Assessment of the socio-economic potential of municipalities	X	X	X		X	X	

Information about the Authors

Vyacheslav N. Bobkov – Doctor of Sciences (Economics), Professor, Honored Science Worker of the Russian Federation, Chief Scientific Officer, head of laboratory, Institute of Socio-Economic Studies of Population – Branch of the Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (32, Nakhimovsky Avenue, Moscow, 117218, Russian Federation); director, Scientific Center of Labor Economics, Plekhanov Russian University of Economics, (36, Stremyanny Lane, Moscow, 117997, Russian Federation; e-mail: bobkovvn@mail.ru)

Nikolay V. Bobkov – Candidate of Sciences (Economics), Senior Lecturer, A.I. Yevdokimov Moscow State University of Medicine and Dentistry (20, building 1, Delegatskaya Street, 127473, Moscow, Russian Federation; e-mail: bobkovnv@bk.ru)

Tatiana V. Chashchina – Candidate of Sciences (Economics); e-mail: chashinatv@mail.ru

Received July 18, 2022.

DOI: 10.15838/esc.2022.4.82.17

Monitoring of the Public Opinion on the Efficiency of Public Administration

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 VolRC 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 (August 2022) and for the period from October 2021 to August 2022 (the last six surveys, that is, almost a year).

The materials present the dynamics of average annual data for 2018-2021[2]. We compare the results of the surveys with the average annual data for 2000 (the first year of Vladimir Putin's first presidential term), 2007 (the last year of Vladimir 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 Vladimir Putin's third presidential term). We also provide monthly data for the last 6 surveys, reflecting the current trends in public opinion assessments of public administration efficiency.

In June – August 2022, the level of approval of the RF President's work continued to grow. The share of positive ratings increased by 3 percentage points (from 58 to 61%); the proportion of negative ratings decreased by 3 percentage points (from 25 to 22%).

In general, during the period from February to August 2022, the proportion of positive judgments about the activities of the head of state increased by 13 percentage points (from 48 to 61%); the share of negative ones decreased by 11 percentage points (from 33 to 22%).

For the last 6 surveys (from October 2021 to August 2022) the level of approval of the activities of the head of state increased by 9 p.p. (from 52 to 61%), the chairman of the government of the Russian Federation – by 8 p.p. (from 40 to 48%), the Vologda Oblast governor – by 6 p.p. (from 38 to 43%)[3].

[1] The surveys are held six times a year in Vologda, Cherepovets, and in eight districts of the oblast (Babayevsky District, Velikoustyugsky District, Vozhegodsky District, Gryazovetsky District, Kirillovsky District, Nikolsky District, Tarnogsky District and Sheksninsky District). The method of the survey is a questionnaire poll by place of residence of respondents. The volume of a sample population is 1,500 people 18 years of age and older. The sample is purposeful and quoted. The representativeness of the sample is ensured by the observance of the proportions between the urban and rural population, the proportions between the inhabitants of settlements of various types (rural communities, small and medium-sized cities), age and sex structure of the Oblast's adult population. Sampling error does not exceed 3%.

More information on the results of VolRC RAS surveys is available at http://www.vscc.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.

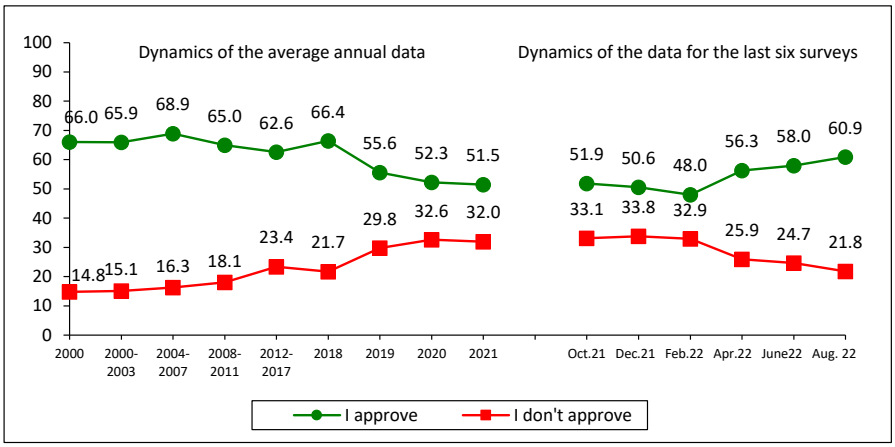
[3] Hereinafter, the results of a comparative analysis of the data from the survey conducted in August 2022 and the results of the monitoring "wave" conducted in October 2021 are given in the frame.

How do you assess the current performance of..? (% of respondents)

Answer option	Dynamics of the average annual data								Dynamics of the data for the last 6 surveys						Dynamics (+/-), Aug. 2022 to	
	2000	2007	2011	2012	2018	2019	2020	2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2022	Aug. 2022	Oct. 2021	June 2022
RF President																
I approve	66.0	75.3	58.7	51.7	66.4	55.6	52.3	51.5	51.9	50.6	48.0	56.3	58.0	60.9	+9	+3
I don't approve	14.8	11.5	25.5	32.6	21.7	29.8	32.6	32.0	33.1	33.8	32.9	25.9	24.7	21.8	-11	-3
Chairman of the RF Government																
I approve	-*	-*	59.3	49.6	48.0	41.1	38.7	39.9	39.7	38.3	37.6	43.6	45.5	47.5	+8	+2
I don't approve	-	-	24.7	33.3	31.6	38.4	40.4	37.6	38.3	38.9	37.7	32.5	31.4	29.4	-9	-2
Governor																
I approve	56.1	55.8	45.7	41.9	38.4	35.7	35.0	36.7	37.5	35.9	33.9	38.2	41.2	43.3	+6	+2
I don't approve	19.3	22.2	30.5	33.3	37.6	40.2	42.5	40.5	40.7	41.9	41.6	37.3	34.3	32.5	-8	-2

The wording of the question: "How do you assess the current work 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 work of the RF President?
(% of respondents, VolRC RAS data)



Answer option	Dynamics,(+/-), August 2022 to October 2021	Dynamics,(+/-), August 2022 to June 2022
I approve	+9	+3
I don't approve	-11	-3

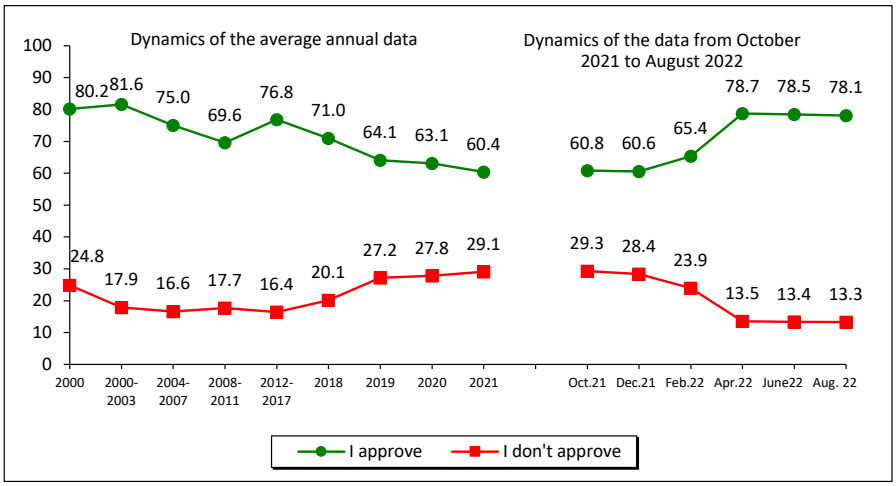
Hereinafter, all graphs show the average annual data for 2000, 2018, 2019, 2020, 2021, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017, corresponding to the presidential terms.

For reference:

According to VCIOM, the level of approval of the RF President's work from June to August did not change and was 78%. Compared to February 2022, there is a significant increase in the share of positive judgments (by 13 p.p., from 65 to 78%).

Positive changes are observed in August 2022 compared to October 2021: the share of positive assessments of the work of the head of state increased by 17 p.p. (from 61 to 78%), the proportion of negative ones decreased by 16 p.p. (from 29 to 13%).

In general, do you approve or not approve of the work of the RF President?
(% of respondents; VCIOM data)



Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
I approve	+17	0
I don't approve	-16	0

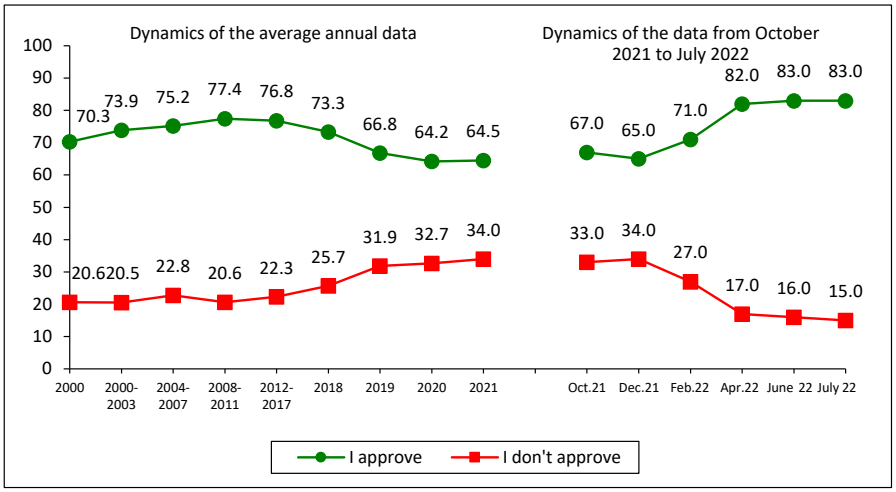
Question: "In general, do you approve or not approve of the work of the President of the Russian Federation?"
Source: VCIOM. Available at: https://wciom.ru/
Data for August 2022 – the average for three surveys: as of August 7, 2022, August 14, 2022 and August 21, 2022.

According to Levada-Center*, the share of positive assessments of the President's work in June – July 2022 amounted to 82%, the share of negative characteristics was 15-16%.

Compared to February 2022, the share of positive assessments of the President's work increased by 12 percentage points (from 71 to 83%), the proportion of negative ones decreased by 12 percentage points (from 27 to 15%).

Compared to October 2021, the level of support for the head of state increased by 16 p.p. (from 67 to 83%); the proportion of negative judgements decreased by 18 p.p. (from 33 to 15%).

In general, do you approve or not approve of the work of Vladimir Putin as President of Russia?
(% of respondents; Levada-Center* data)



Dynamics,(+/-), July 2022 to		
Answer option	October 2021	June 2022
I approve	+16	0
I don't approve	-18	-1

Question: "In general, do you approve or not approve of the work of Vladimir Putin as President of Russia?"
Source: Levada-Center*. Available at: https://www.levada.ru

* Included in the register of foreign agents.

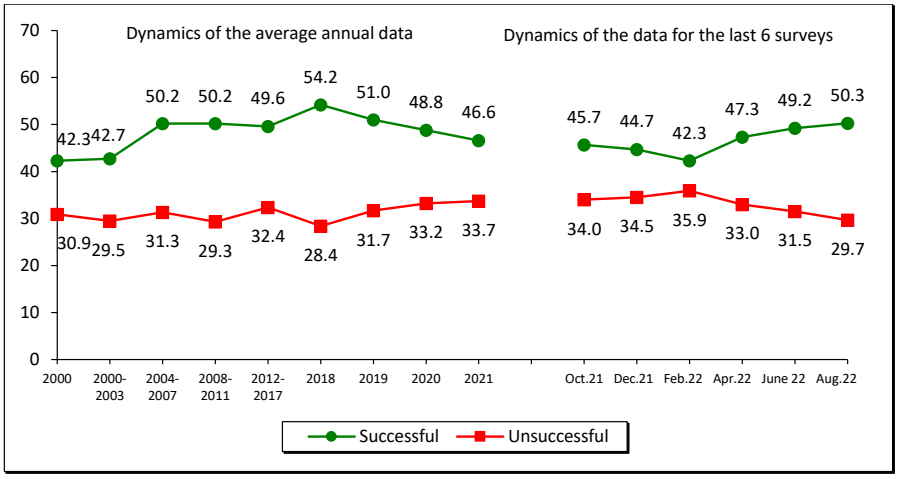
In your opinion, how successful is the RF President in coping with challenging issues?
(% of respondents; VolRC RAS data)

Over the past two months, the share of those who consider the RF President's work to strengthen Russia's international positions to be successful did not change significantly (49–50%). The proportion of those who hold the opposite point of view decreased by 2 p.p. (from 32 to 30%).

From February to August 2022, the share of positive assessments increased by 7 p.p. (from 42 to 50%); the proportion of negative ones decreased by 6 p.p. (from 36 to 30%).

Compared to October 2021, the proportion of residents of the region who positively assess the activities of the head of state to strengthen Russia's international positions increased by 4 p.p. (from 46 to 50%). The share of negative judgments decreased by 4 p.p. as well (from 34 to 30%).

Strengthening Russia's international position



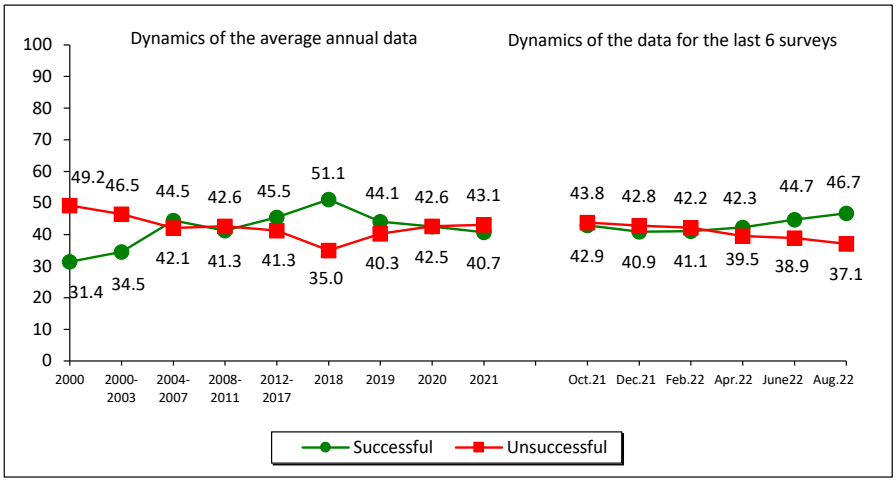
Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
Successful	+4	+1
Unsuccessful	-4	-2

In June – August 2022, the share of Vologda Oblast residents who positively assess the President's work in the field of imposing order in the country increased by 2 percentage points (from 45 to 47%). The share of negative assessments decreased by 2 percentage points, respectively (from 39 to 37%).

In general, for the period from February to August 2022, the share of positive characteristics increased by 6 percentage points (from 41 to 47%); the proportion of negative characteristics decreased by 5 percentage points (from 42 to 37%).

From October 2021 to August 2022, the proportion of Vologda Oblast residents who consider the work of the head of state to restore order in the country to be successful increased by 4 percentage points (from 43 to 47%). The share of negative judgments decreased by 7 percentage points (from 44 to 37%).

Imposing order in the country



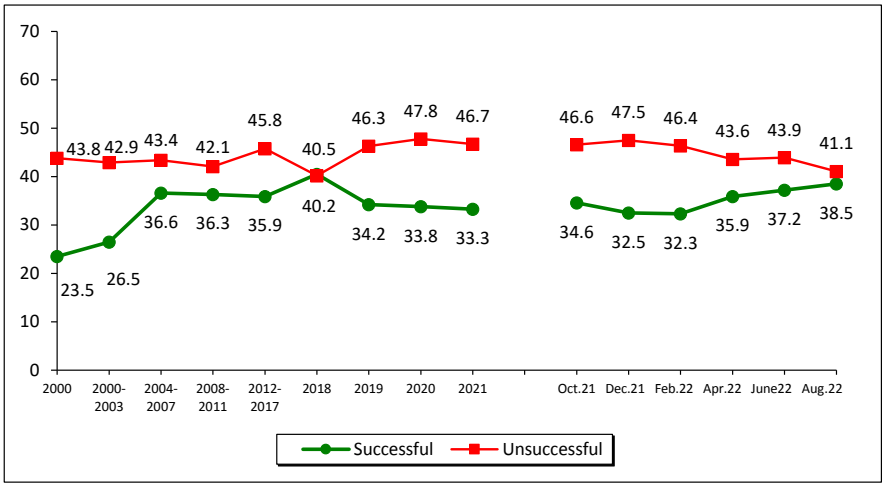
Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
Successful	+4	+2
Unsuccessful	-7	-2

Minor positive changes over the past two months were also noted in the dynamics of people's assessments of the RF President's success in protecting democracy and strengthening citizens' freedoms. From June to August 2022, the share of positive judgments increased by 2 percentage points (from 37 to 39%), the share of negative characteristics decreased by 3 percentage points (from 44 to 41%).

In general, for the period from February to August 2022, the share of positive assessments increased by 7 percentage points (from 32 to 39%), the proportion of negative judgements decreased by 5 percentage points (from 46 to 41%).

Over the last six surveys (from October 2021 to August 2022), the share of Vologda Oblast residents who consider the President's work to protect democracy and strengthen citizens' freedoms to be successful increased by 4 percentage points (from 35 to 39%). The proportion of those who share the opposite opinion decreased by 6 percentage points (from 47 to 41%).

Protecting democracy and strengthening citizens' freedoms



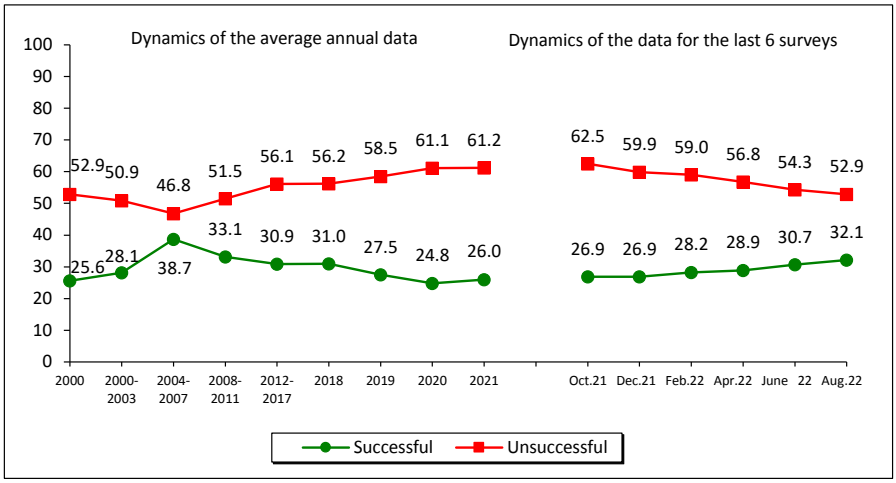
Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
Successful	+4	+1
Unsuccessful	-6	-3

People's assessments of the RF President's success in addressing the problem of economic recovery and the growth of the welfare of citizens for the period from June to August 2022 did not change significantly. The share of positive judgments was 31–32%, negative – 53–54%

From February to August 2022, mainly positive changes are noted: the share of positive judgments increased by 4 percentage points (from 28 to 32%); negative – decreased by 6 percentage points (from 59 to 53%).

Over the last six surveys (from October 2021 to August 2022), the proportion of positive judgments increased by 5 p.p. (from 27 to 32%), the share of negative ones decreased by10 p.p (from 63 to 53%).

Economic recovery and increase in citizens' welfare



Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
Successful	+5	+1
Unsuccessful	-10	-1

The structure of political preferences of Vologda Oblast residents did not change over the past two months: the share of people whose interests are expressed by the United Russia party is 35–36%, the KPRF – 10%, the LDPR – 7%, the Just Russia – 5%, the New People – 2%.

Support for United Russia increased slightly from February to August 2022 (by 5 p.p., from 31 to 36%).

Compared to October 2021, the share of supporters of the United Russia party increased by 3 p.p. (from 33 to 36%);

Which party expresses your interests? (% of respondents; VoIRC RAS data)

Party	Dynamics of the average annual data												Dynamics of the data for the last 6 surveys						Dynamics (+/-), Aug. 2022 to	
	2000	2007	2011	Election to the RF State Duma 2011, fact	2012	2016	Election to the RF State Duma 2016, fact	2018	2019	2020	Election to the RF State Duma 2020, fact	2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2022	Aug. 2022	Oct. 2021	June 2022
United Russia	18.5	30.2	31.1	33.4	29.1	35.4	38.0	37.9	33.8	31.5	49.8	31.7	32.7	31.9	31.1	34.2	34.9	36.2	+4	+1
KPRF	11.5	7.0	10.3	16.8	10.6	8.3	14.2	9.2	8.8	8.4	18.9	9.3	11.1	10.5	9.5	11.2	10.2	10.4	-1	0
LDPR	4.8	7.5	7.8	15.4	7.8	10.4	21.9	9.6	9.1	9.5	7.6	9.9	11.2	9.9	9.4	7.7	7.8	6.8	-4	-1
Just Russia – Patriots for the Truth	-	7.8	5.6	27.2	6.6	4.2	10.8	2.9	3.4	4.7	7.5	4.7	6.3	6.0	5.7	4.5	4.8	4.9	-1	0
New People*	–	–	–	–	–	–	–	–	–	–	5.3	2.3	–	2.3	1.6	1.3	1.6	1.9	–	0
Other	0.9	1.8	1.9	–	2.1	0.3	–	0.7	0.3	0.5	–	0.2	0.5	0.2	0.7	0.3	0.1	0.1	0	0
None	29.6	17.8	29.4	–	31.3	29.4	–	28.5	33.7	34.2	–	33.9	31.7	29.6	32.4	30.8	30.7	29.3	-2	-1
I find it difficult to answer	20.3	21.2	13.2	–	11.7	12.0	–	11.2	11.0	11.1	–	10.0	6.6	9.7	9.6	10.0	9.9	10.5	-4	-1

* The New People party was elected to the State Duma of the Russian Federation for the first time following the results of the election held on September 17–19, 2021.

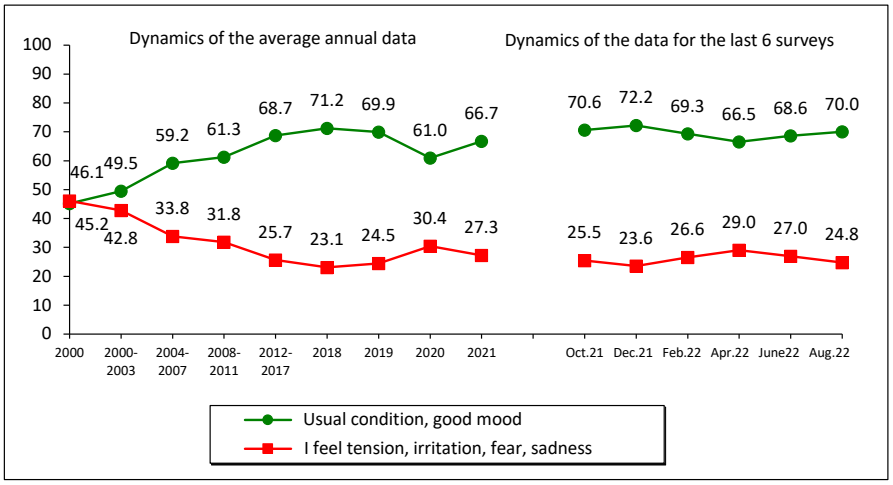
Estimation of social condition (% of respondents; VolRC RAS data)

In August 2022, compared with June, the share of Vologda Oblast residents describing their daily emotional state as "normal, good" did not change significantly (69–70%); the proportion of people who mostly feel "tension, irritation, fear, sadness" decreased by 2 percentage points (from 27 to 25%).

In general, for the period from February to August 2022, estimates of social mood remain stable: the share of positive judgments is 69–70%, the proportion of negative ones is 25–27%.

Compared with October 2021, there were no significant changes in the estimates of social mood.

Social mood



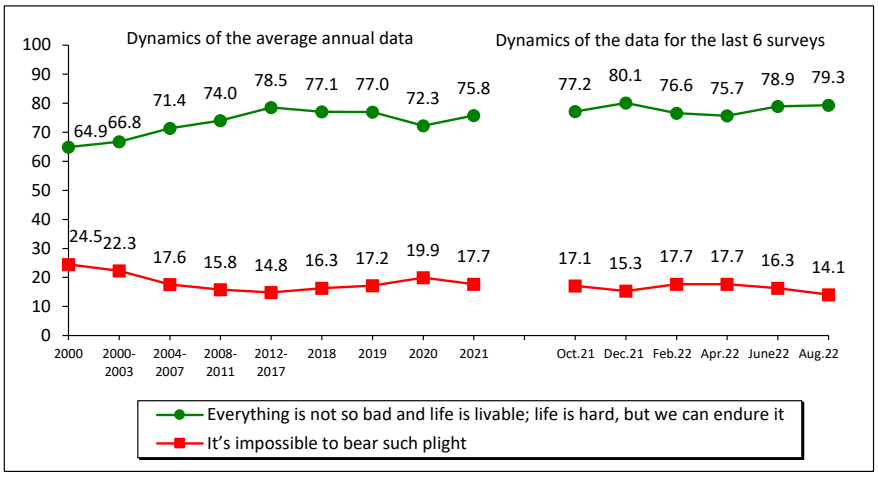
Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
Usual condition good mood	-1	+1
I feel tension, irritation, fear, sadness	-1	-2

There were no significant changes in the dynamics of the stock of patience indicator over the past two months: the share of positive ratings is 79%, negative ones – 14–16%.

Compared to February 2022, in August, the share of positive assessments of the stock of patience increased slightly (by 2 percentage points, from 77 to 79%); the share of negative characteristics decreased (by 4 percentage points, from 18 to 14%).

Compared to August 2021, positive changes are also observed in August 2022: the proportion of positive ratings increased by 2 percentage points (from 77 to 79%), the share of negative ratings decreased by 3 percentage points (from 17 to 14%).

Stock of patience

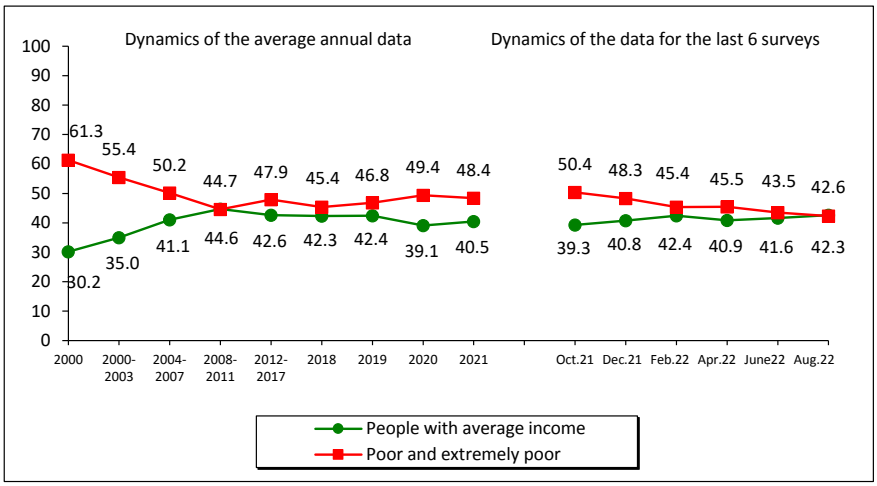


Dynamics,(+/-), August 2022 to		
Answer option	October 2021	June 2022
Everything is not so bad and life is livable; life is hard, but we can endure it	+2	0
It's impossible to bear such plight	-3	-2

The proportion of Vologda Oblast residents subjectively classifying themselves as "poor and extremely poor" decreased by 2 percentage points over the past two months (from 44 to 42%), for the period from February to August – by 3 percentage points (from 45 to 42%).

Over the last six surveys (from October 2021 to August 2022), the share of "poor and extremely poor" residents of the region has decreased by 8 p.p. (from 50 to 42%); the proportion of "middle-income" people increased by 4 p.p. (from 39 to 43%).

Social self-identification*



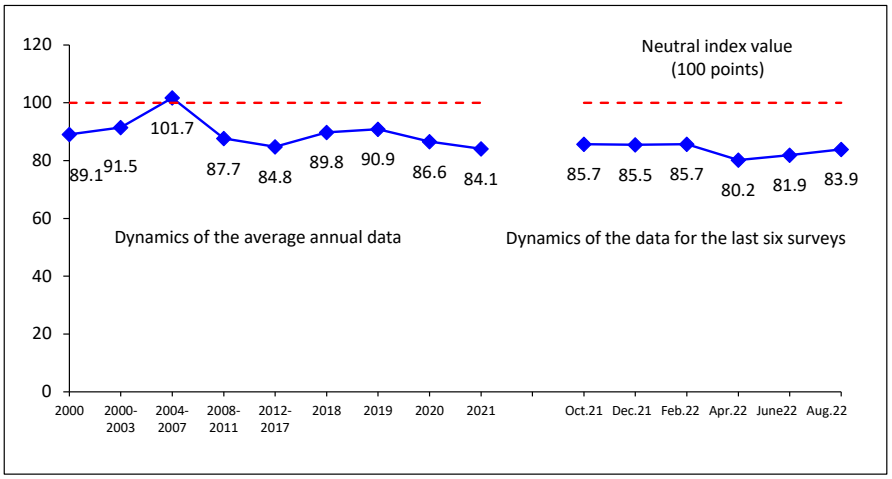
Answer option	Dynamics,(+/-), August 2022 to October 2021	Dynamics,(+/-), August 2022 to June 2022
People with average income	+3	+1
Poor and extremely poor	-8	-1

* Question: "What category do you belong to, in your opinion?"

From June to August 2022, the Consumer Sentiment Index increased slightly (by 2 points, from 82 to 84 points), which indicates an improvement in people's forecasts regarding the future of the Russian economy and their personal financial situation.

However, the CSI still remains significantly lower than in February 2022 and in August 2021 (by 2 points, 84 p. vs 86 p.).

Consumer Sentiment Index
(CSI, points; data of VolRC RAS for the Vologda Oblast)

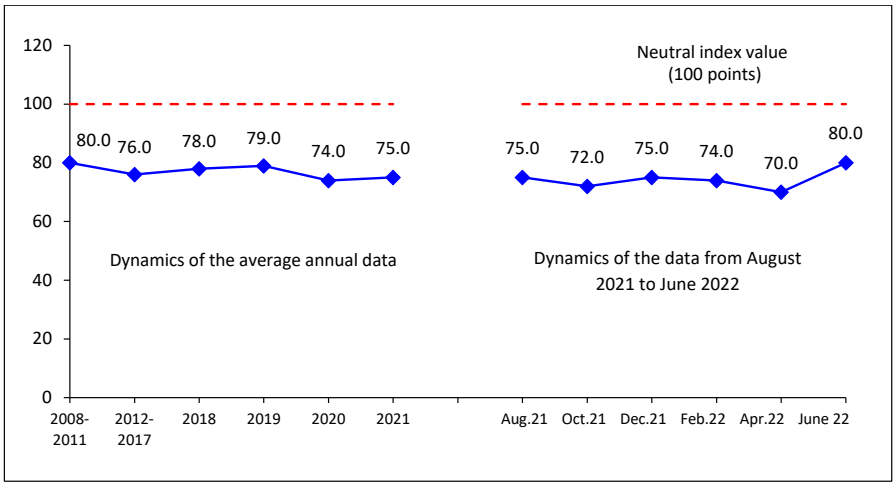


CSI	Dynamics,(+/-), August 2022 to October 2021	Dynamics,(+/-), August 2022 to June 2022
Index value, points	-2	+2

For reference:

According to the latest data from Levada-Center (as of June 2022), the Consumer Sentiment Index nationwide amounted to 80 points, which is 10 points higher than in April 2022 (70 points) and 5 points higher than in August 2021 (75 p.).*

Consumer Sentiment Index (CSI; Levada-Center* data for Russia)



Dynamics,(+/-), June 2022 to		
CSI	August 2021	April 2022
Index value, points	+5	+10

The index is calculated since 2008.

Latest data are as of June 2022.

Source: Levada-Center*. Available at: https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/

In most socio-demographic groups (in 9 out of 14), there were no significant changes in the dynamics of positive assessments of social mood over the past two months. A slight increase (by 3 percentage points) in the share of positive judgments is noted among men (from 67 to 70%), people aged 30–55 (from 69 to 72%), people with secondary and incomplete secondary education (from 66 to 69%), as well as in the group of 60% of middle-income residents of the region (from 70 to 73%).

The decrease in the proportion of positive characteristics of social mood in June – August 2022 is noted only among persons who, according to self-estimates of income, belong to the category of 20% of the least affluent residents of the region (by 3 percentage points, from 58 to 55%).

In comparison with February 2022, social mood assessments also remain generally stable: in 8 out of 14 groups, the proportion of positive judgments did not change; in 4 groups, the proportion of people describing their mood as "normal, good" increased; negative changes are noted in 2 groups (among 20% of the least affluent and 20% of the most affluent residents of the region).

Over the last 6 surveys (October 2021 – August 2022), there were no changes in social mood in half of the analyzed groups, however, the share of positive characteristics of social mood decreased in five groups, namely:

- ✓ persons over 55 years of age (by 4 percentage points, from 68 to 64%);
- ✓ persons with higher and incomplete higher education (by 6 percentage points, from 77 to 71%);
- ✓ 20% of the least well-off (by 5 percentage points, from 60 to 55%);
- ✓ 20% of the most affluent (by 7 percentage points, from 84 to 77%);
- ✓ residents of Vologda (by 3 percentage points, from 64 to 61%)

* Included in the register of foreign agents.

Social mood in different social groups (answer option "Wonderful mood, normal, stable condition", % of respondents; VolRC RAS data)

Population group	Dynamics of the average annual data								Dynamics of the data for the last 6 surveys						Dynamics (+/-), Aug. 2022 to	
	2000	2007	2011	2012	2018	2019	2020	2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2022	Aug. 2022	Oct. 2021	June 2022
Sex																
Men	50.1	65.9	64.5	69.1	72.8	70.1	60.8	65.7	70.0	71.5	65.5	68.3	67.4	69.9	0	+3
Women	43.3	61.7	62.0	65.8	69.8	69.6	61.2	67.4	70.9	72.8	72.3	65.1	69.7	70.2	-1	+1
Age																
Under 30	59.1	71.3	70.0	72.3	80.0	81.1	67.6	73.5	75.3	81.9	75.3	81.8	77.3	77.8	+3	+1
30–55 лет	44.2	64.8	62.5	67.9	72.6	71.2	61.8	69.5	70.8	75.1	70.7	71.1	68.8	72.0	+1	+3
Over 55	37.4	54.8	58.3	62.1	65.2	63.3	57.4	60.5	68.3	65.2	65.3	55.2	65.3	64.6	-4	-1
Education																
Secondary and incomplete secondary	41.7	58.4	57.4	57.2	64.8	63.2	56.1	62.1	64.1	69.7	68.7	63.0	65.8	68.5	+4	+3
Secondary vocational	46.4	64.6	63.6	66.7	72.2	72.7	63.5	66.7	70.4	70.1	68.3	69.8	70.5	71.0	+1	+1
Higher and incomplete higher	53.3	68.6	68.3	77.0	76.8	73.4	63.3	71.5	77.1	77.6	71.5	66.9	69.7	70.8	-6	+1
Income groups																
Bottom 20%	28.4	51.6	45.3	51.5	57.3	53.2	43.4	54.6	60.4	64.0	60.5	61.5	58.4	55.4	-5	-3
Middle 60%	45.5	62.9	65.3	68.7	71.9	71.4	62.6	67.3	70.9	71.1	68.8	64.2	70.3	73.2	+2	+3
Top 20%	64.6	74.9	75.3	81.1	82.9	81.8	75.6	79.9	84.2	85.3	81.5	81.9	75.7	77.0	-7	+1
Territories																
Vologda	49.2	63.1	67.1	73.6	71.0	68.6	60.9	60.3	64.0	65.7	63.2	60.2	61.0	61.5	-3	+1
Cherepovets	50.8	68.1	71.2	76.2	75.8	71.2	60.4	71.0	75.2	75.1	72.6	70.1	72.8	74.6	-1	+2
Districts	42.2	61.6	57.1	59.8	68.7	69.8	61.4	67.8	71.5	74.2	70.8	68.1	70.6	72.3	+1	+2
Oblast	46.2	63.6	63.1	67.3	71.2	69.9	61.0	66.6	70.5	72.2	69.3	66.5	68.7	70.1	0	+1

RESUME

According to the results of the last "wave" of public opinion monitoring conducted in August 2022, the background of social sentiment in the Vologda Oblast remains stable.

Since February 2022, when Russian President Vladimir Putin announced the start of a special military operation on the territory of Ukraine, there has been a steady trend toward increasing the level of approval of the activities of the authorities, and this applies not only to the head of state, but also to the Chairman of the Government of the Russian Federation and the governor of the Vologda Oblast. In general, during the period from February to August 2022, the share of positive assessments of their work increased by 10–13 percentage points. In addition, during the same period, the proportion of people who believe that the United Russia party shares their interests increased by 5 percentage points. The data also indicate that broad segments of the population as a whole share the policy of the state and feel the impact of measures taken by government bodies to maintain the standard of living and quality of life.

The estimates give by the region's residents to the RF President's efforts to solve the key problems of the country confirm this conclusion. Thus, during the period from February to August 2022, the share of people who consider the actions of the head of state to strengthen Russia's international position to be successful increased by 8 percentage points (from 42 to 50%), to restore order in the country – by 6 p.p. (from 41 to 47%), to protect democracy – by 7 p.p. (from 32 to 39%), to ensure the recovery of the economy and the growth of the welfare of citizens – by 4 p.p. (from 28 to 32%).

It should also be noted that after the quite natural first reaction of people to the events of February – March 2022 (the beginning of a special military operation on the territory of Ukraine, intensification of economic sanctions by the United States and NATO countries, withdrawal of many foreign companies from the Russian market, tightening of legislation in the field of information policy, etc. the main indicators of social sentiment have acquired a fairly stable positive vector by the middle of the year. Thus, from April to August 2022, we observe a gradual increase in:

the share of Vologda Oblast residents who positively characterize their daily emotional state (by 3 percentage points, from 67 to 70%);

the proportion of people who believe that "everything is not so bad and life is livable; life is hard, but we can endure it (by 3 percentage points, from 76 to 79%);

the Consumer Sentiment Index (CPI), which indicates an increase in the optimistic forecasts of society regarding the future of the Russian economy and personal financial situation (by 4 points, from 80 to 84 p.).

Besides, the proportion of people subjectively classifying themselves as "poor and extremely poor" for the period from April to August 2022 decreased by 3 percentage points (from 46 to 43%).

Trends in key indicators of public sentiment in February – August 2022 (% of respondents; CSI – in points)

Indicator	Feb. 2022	Apr. 2022	June 2022	Aug. 2022	Dynamics (+/-), Aug. 2022 to	
					Feb. 2022	June 2022
Share of positive assessments of the RF President's work	48.0	56.3	58.0	60.9	+13	+3
Share of positive assessments of social mood	69.3	66.5	68.7	70.1	+1	+1
Share of positive assessments of the stock of patience	76.6	75.7	78.9	79.3	+3	0
Share of the "poor and extremely poor"	45.4	45.35	43.5	42.3	-3	-1
Consumer Sentiment Index (CPI)	85.7	80.2	81.9	83.9	-2	+2

Of course, we cannot say that these positive changes in the main indicators of the social well-being of Vologda Oblast residents are pronounced (such as, for example, the growth of the CSI nationwide, which, according to Levada-Center*, increased from April to June by 10 points, from 70 to 80 points). However, in the current alarming context regarding the foreign policy and domestic socio-economic conditions, we can argue that the authorities generally manage to maintain a stable socio-psychological climate, including in the region.

At the same time, the positive changes regularly noted during the last three "waves" of monitoring in the dynamics of the main indicators of social well-being and support of the authorities are so insignificant

* Included in the register of foreign agents.

(no more than 3 percentage points) that in fact there is always a risk of changing the vector of dynamics from positive to negative. We can say that society is in a state of anxious expectation, pinning their hopes on the state and at the same time realizing the seriousness of the threats that the country is facing.

The further dynamics of public sentiment, of course, will largely depend on the development of international events (especially on the course of a special military operation). However, the more people get confident that the state is able to protect the standard of living and quality of everyday life of citizens, the more demanding they will be with regard to their dynamic development. This suggests that the pace of taking measures aimed at social protection of the population, at least, should not be slowed down.

And this is especially true for the support of socially vulnerable groups in which, as the monitoring data show, since April 2022, negative changes in social mood have been observed (for example, the share of positive assessments of social mood in the group of the bottom 20% in April 2022 was 62%, in June – 58%, in August – 55%).

For the general population, with the approach of the autumn–winter period (when the vacation period ends, the climate becomes colder, housing and communal services tariffs increase seasonally), issues related to the internal socio-economic agenda are becoming more acute, and the authorities should be prepared for the fact that the role of this factor in shaping the overall dynamics of social sentiment will increase.

Materials were prepared by M.V. Morev, I.M. Bakhvalova

AUTHOR GUIDELINES
for Submission of Manuscripts to the Editor of the Scientific Journal
Economic and Social Changes: Facts, Trends, Forecast

The Journal publishes original theoretical and experimental articles that fall within the scope of the journal. The manuscript should be of no less than 16 pages (30,000 characters with spaces). The maximum length of the paper submitted to publication is 25 pages (approximately 50,000 characters with spaces). Book reviews, information on scientific conferences, scientific chronicles are also submitted to publication. The papers should contain research findings of completed and methodologically proper works.

The decision for publication is made by the Journal's Editorial Staff on the basis of the reviewer's report. The novelty, scientific importance and relevance of submitted material are also taken into consideration. Articles rejected by the Editorial Staff will not be re-considered.

Requirements to the package of materials submitted

The following materials are submitted to the editorial office in electronic form:

1. A file containing the article in a Microsoft Word document, format .docx. The name of the file is typed in the Roman characters and reflects the author's last name (e.g.: Ivanova.docx).
2. Full information about the author on a separate page: full name, academic degree and title, place of work and position, contact information (postal address, telephone, e-mail – if available), ORCID, Researcher ID. The information should be arranged in a table.
3. Scanned copy of the commitment of the author not to publish the article in other publications.
4. A color photo of the author in the .jpeg / .jpg format of no less than 1 MB.

The package of materials is to be sent to the editor's email address: esc@volnc.ru.

Text design requirements

1. Margins

Right – 1 cm, others – 2 cm.

2. Font

Font size of the article's text – 14, type – Times New Roman (in case a special type font is needed, when typing Greek, Arab, etc. words, Windows default fonts are to be used). In case the paper contains seldom used fonts, they (font family) are to be submitted along with the file. Line interval – 1,5.

3. Indent – 1.25. Made automatically in MS Word.

4. Numbering

Page numbers are placed in the lower right corner of the page automatically with the use of MS Word tools.

5. First page of the article

In the upper right corner, the UDC is placed, under it, after the 1.5 spacing – the LBC, then – the symbol ©, indent (spacing), and the name and initials of the author in semi-bold. After the 2-spacing indent, the title of the article is given. Central alignment is used for the title of the article given in semi-bold. The abstract and key words are given below, after the 2-spacing indent, without a paragraph indent, in italics and aligned by width. Then, after the 2-spacing indent, the text of the article is placed.

6. Abstract

The abstract contains from 200 to 250 words. The abstract states the purpose of the research, points out its undoubted scientific novelty and its differences from similar works of other scientists; contains the methods used by the author and the main results of the work performed; identifies areas of application of the results of the study; briefly formulates the prospects for further research in this area.

Examples of good abstracts for different types of articles (reviews, scientific articles, conceptual articles, application articles) are available at: http://www.emeraldinsight.com/authors/guides/write/abstracts.htm?part=2&PHPSESSID=hdac5rtkb73ae013ofk4g8nrv1.

7. Key words

There should be not more than eight words or word combinations. Key words should reflect the content of the manuscript to the fullest extent. The number of words within a phrase should not exceed three.

8. Tables

The caption of the table and its number (if present) are given in normal font, without highlighting. The caption runs in bold and is center aligned.

Tables are inserted; drawing tools and AutoShapes are not allowed; column and cell alignment using spaces or tabs is not allowed. MS WORD table editor is used for tables. Each piece of data of the stub and head of the table correspond to discrete cell. Only editor standard tools are applied for creating and formatting tables, no pilcrows, spaces and extra blank lines for semantic breakdown and line adjustment are allowed.

9. Figures (schemes, graphs, diagrams)

The caption and its number are placed below the figure. The word "Figure" is in normal font (without highlighting). The caption runs in bold, center alignment, single-spaced.

MS EXCEL is to be used for creating charts, MS WORD, MS VISIO – for flow charts, MS Equation for formulas.

Figures and charts, created in MS WORD are to be grouped within one single object. No scanned, exported or taken from the Internet graphic materials are allowed in the article.

Algorithm of charts insertion from MS EXCEL to MS WORD:

1) in MS EXCEL select the chart, using the mouse, right click and select "copy" from the list of options;

2) in MS WORD right-click, select "paste" from the list of options, click on "paste special", "Microsoft Excel chart".

The title of the figure and its number are placed below the figure. The word "Fig." is in common type face. The caption is given in bold and is center aligned.

10. Bibliographic description of the sources under tables and figures

Write: either "Source", or "Compiled with the use of", or "Calculated with the use of", etc., after that – information about the source.

11. Page footnotes

Page footnotes are executed according to GOST R 7.0.5 – 2008.

12. References

The word "References" is given after a 1.5 spacing after the body of the article in lowercase letters, semi-bold italics, center alignment. Then, the list of references is given after the 1.5 spacing.

The sources are arranged alphabetically: Russian-language sources go first, then – English-language sources.

In case the paper has a DOI, it is given in the References.

References to Russian-language sources are given in accordance with GOST R 7.0.5 – 2008. References to English-language sources are given in accordance with a modified Harvard standard[1].

The list of references contains links to scientific works used by the author in the preparation of the article. It is obligatory that the author provides links to all the sources from the list of references in the body of the article.

In accordance with international publishing standards, the recommended number of sources in the References should be at least 20, of which at least 30% should be foreign sources.

The number of links to the author's works should not exceed 10% of the total number of references given in the list.

It is not recommended to include the following sources in the list of references:

1) articles from any non-scientific magazines and newspapers;
2) regulatory and legislative acts;
3) statistical compilations and archival materials;
4) sources without attribution of the author (for example, collections under someone's editorship);
5) dictionaries, encyclopedias, other reference books;
6) reports, records, memos, protocols;
7) textbooks, etc. It is recommended to provide the corresponding page footnotes for these sources.

[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.

It is recommended to include the following sources in the list of references:

1) articles from printed scientific journals (or electronic versions of printed scientific journals);

2) books;

3) monographs;

4) published conference proceedings;

5) patents.

A reference to the bibliographic source in the body of the article is given in parentheses indicating the author's surname and the year of publication. It is possible to make reference to multiple sources from the list, which should be separated by a semicolon (for example: (Ivanov, 2020), (Ivanov, 2020; Petrov, 2018), etc.).

Articles that do not have the complete package of accompanying documents and articles that do not conform to the editor's requirements are not accepted.

SUBSCRIPTION INFORMATION

Dear readers!

You can subscribe to the journal *Economic and Social Changes: Facts, Trends, Forecast:*

1) at an office of the Russian Post (via the integrated catalog "Press of Russia", the Journal's subscription index is 41319);

2) at the website http://www.akc.ru;

3) by contacting the Journal's editorial office (contact person – Anna S. Artamonova, phone: 8 (8172) 59-78-32, e-mail: esc@volnc.ru).

Make-up page T.V. Popova
Translators and Proof-readers A.A. Popova
A.D. Kirillova
O.M. Pokhila

Passed for printing September 15, 2022.
Date of publication September 22, 2022.
Format 60×84 1/8. Digital recording.
Con. pr. sheets 34.8. Number of copies 500. Order No. 45.
Price is open.

The journal is registered with the Federal Service
for Supervision of Telecom and Mass Communications (Roskomnadzor).
Certificate of registration PI FS77-71361 dated October 26, 2017.

Founder: Federal State Budgetary Institution of Science
"Vologda Research Center of the Russian Academy of Sciences" (VolRC RAS)

Address of the Publisher and Editorial Office:
56A, Gorky St., Vologda, 160014, Russia
phone (8172) 59-78-03, fax (8172) 59-78-02, e-mail: common@volnc.ru